PC WORLD

LOTUS EDITION

January 1994 $3.95

POWER PLAY

Pentiums Bump 486s as Best Buys

Plus: 50 Tips for the Lotus Suite
Choosing the Right DOS
Top Personal Finance Software
Is Disk Compression Safe?

WIN A 486-66 PC!
RATE YOUR PC MAKER'S SERVICE AND SUPPORT

Printed in USA

AFTER YEARS OF SETTING THE SPREADSHEET STANDARD, THERE WAS ONLY ONE THING LEFT TO DO.

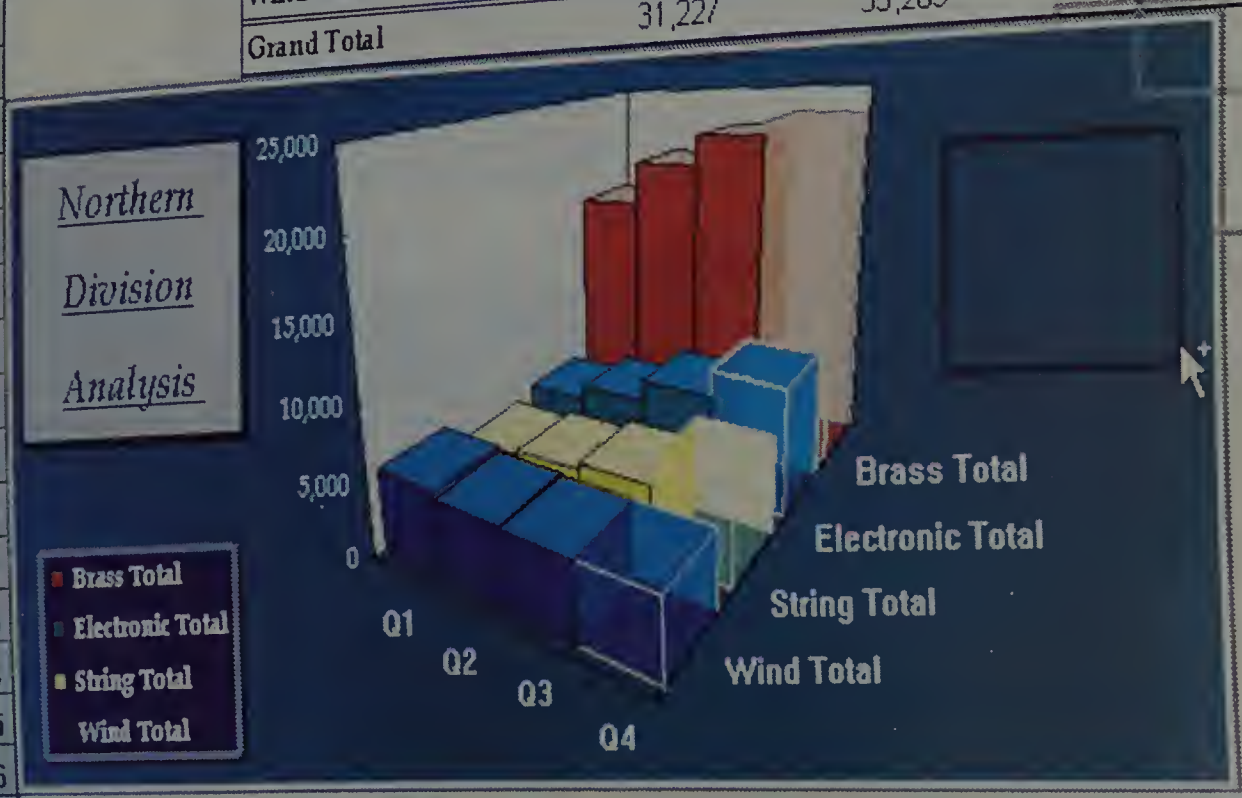
Microsoft Excel - REVENUES.XLS

File Edit View Insert Format Tools Data Window Help

Arial 10 100%

Northern Division Sales

CATEGORY	Q1	Q2	Q3	Q4
Brass Total	17,157	20,233	22,414	23,390
Electronic Total	4,637	5,564	6,955	8,722
String Total	3,904	4,366	4,328	8,420
Wind Total	5,529	5,126	4,982	4,932
Grand Total	31,227	35,289	39,179	43,464



North South East We

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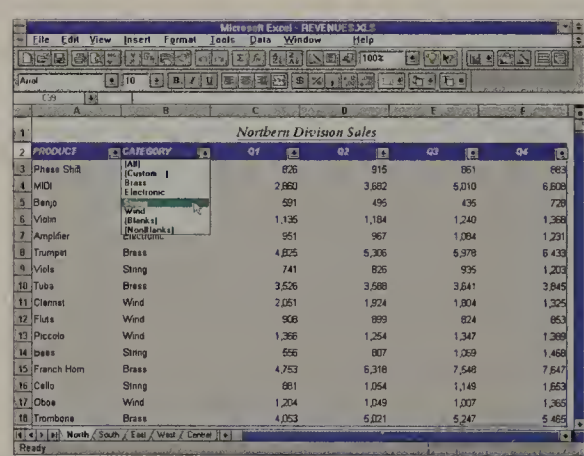
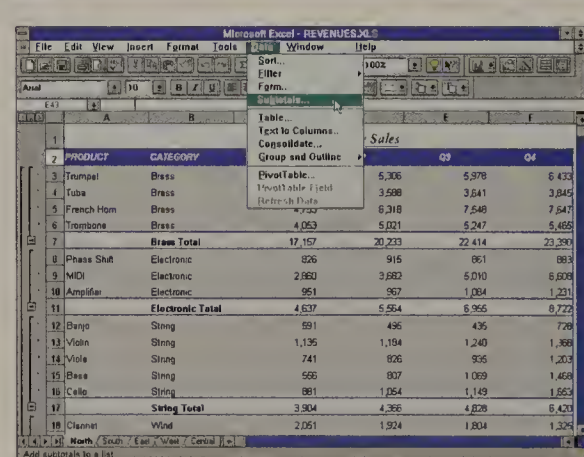


Want to quickly browse through your information? AutoFilter lets you pick the information you need and filter out the rest.



Outlining lets you collapse and expand details of your worksheet while the Subtotal feature adds your numbers automatically.

IntelliSense™ technology. It's in all the programs in the Microsoft Office family. It senses what you're doing and knows how to help you do more, with a lot less effort. Everyday jobs are automatic, complex jobs are a snap.

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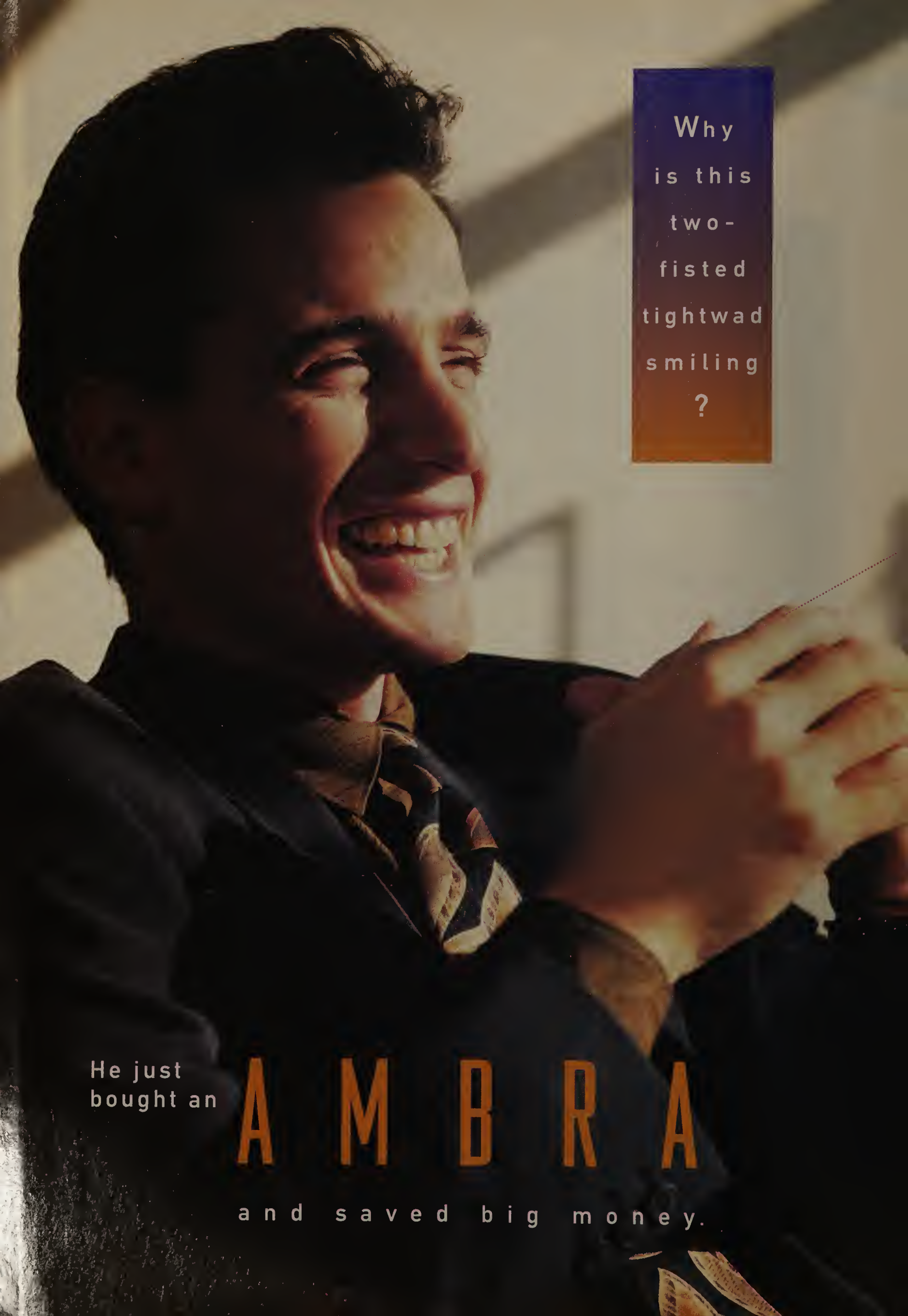
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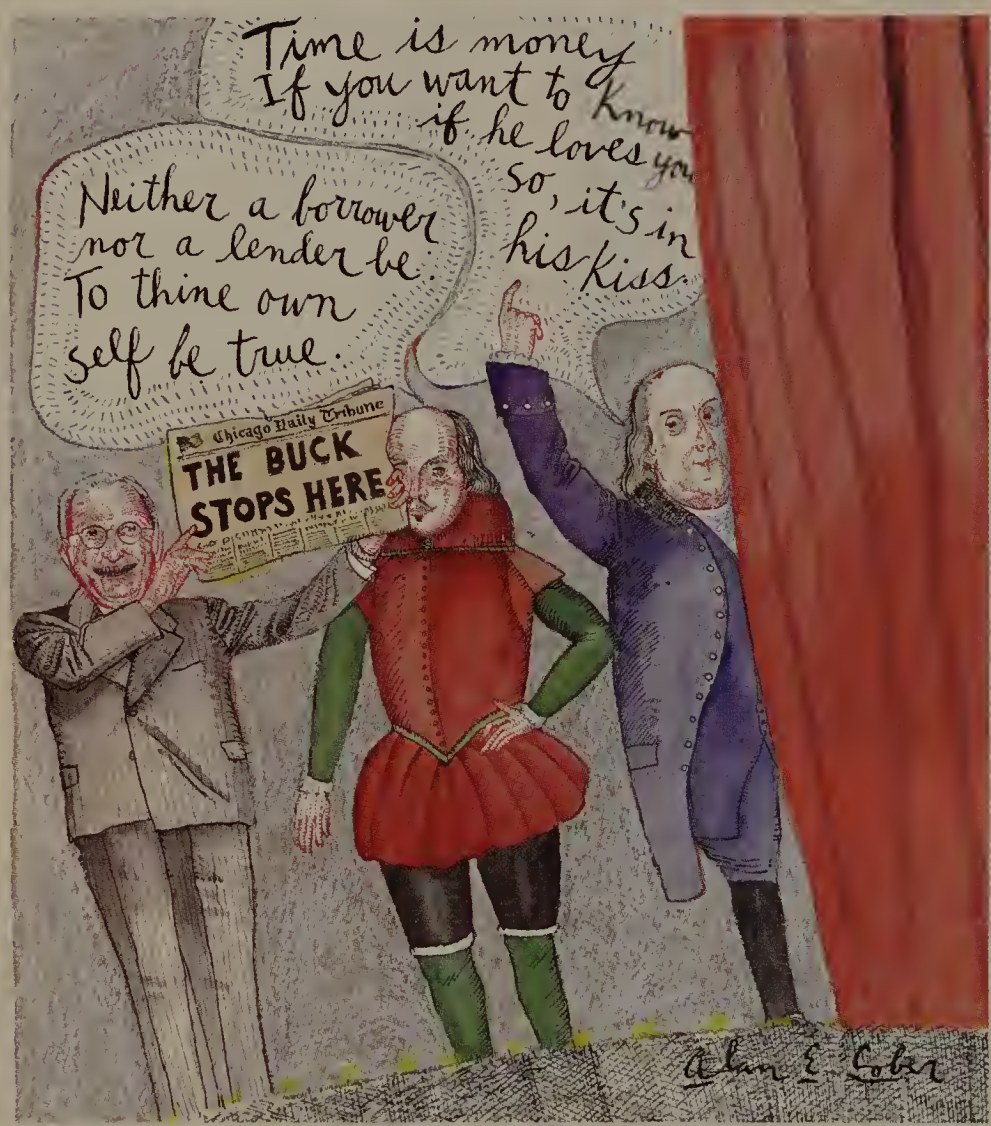

Cover Story

130 PCs for the Power Hungry: Pentiums vs. 486DX2-66s
It's no surprise that the first 60-MHz Pentium PCs from Acer, ALR, Compaq, and IBM turn in astounding performance. But compared to top-of-the-line 486DX2-66s, is the performance worth the price? Our reviewers pit the Pentiums against 20 of the latest DX2-66s.

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161 Are You Ready for Mass Market PCs?
Now you can shop for your PC at the same giant discount stores and warehouses where you buy your television, microwave, even paper towels and Cheetos. It's convenient and cheap, but it's not without problems.

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All competitively priced and claiming compatibility, three new DOS upgrades are vying for your attention: Microsoft's MS-DOS 6.2, IBM's PC-DOS 6.1, and Novell's DOS 7. We assess their safety and their strengths.

Lotus: Get the Most From the Lotus Suite

124-L4 50 Tips for the Windows Suite
We've gathered up the best timesaving techniques for Lotus's industrial-strength line of Windows applications: 1-2-3, Improv, Ami Pro, Freelance Graphics, Notes, cc:Mail, Organizer, and Approach.

124-L15 Start the Year Right With 1-2-3 Organizers
You can't be too rich, too thin, or too well organized, and here's some help to bring you closer to your goals. Our simple models will help you balance your checkbook, plan your diet, create a budget, and remind yourself of key dates.

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Cover photography by Stan Musilek

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How satisfied are you with your PC? Have you had problems? Or is your PC trouble-free? Tell us about it! Fill out and fax in this month's survey for a chance to win a Gateway 2000 4DX2-66V, a Best Buy PC featured in this month's system review.

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89 AST Advantage Adventure multimedia PCs
90 Panasonic CF-V21P notebook PC
90 Compaq Concerto notebook PC
92 Hewlett-Packard DeskJet 310, Canon BJC-600 color ink jet printers
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98 Lotus SmartSuite 2.1, Microsoft Office 4
102 CypherScan 1000, Cognitive BCR, Scan-in-Dex business card scanners
104 Aldus PhotoStyler 2.0 image editing software
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109 Cacre OmniPage Professional 5.0 OCR software
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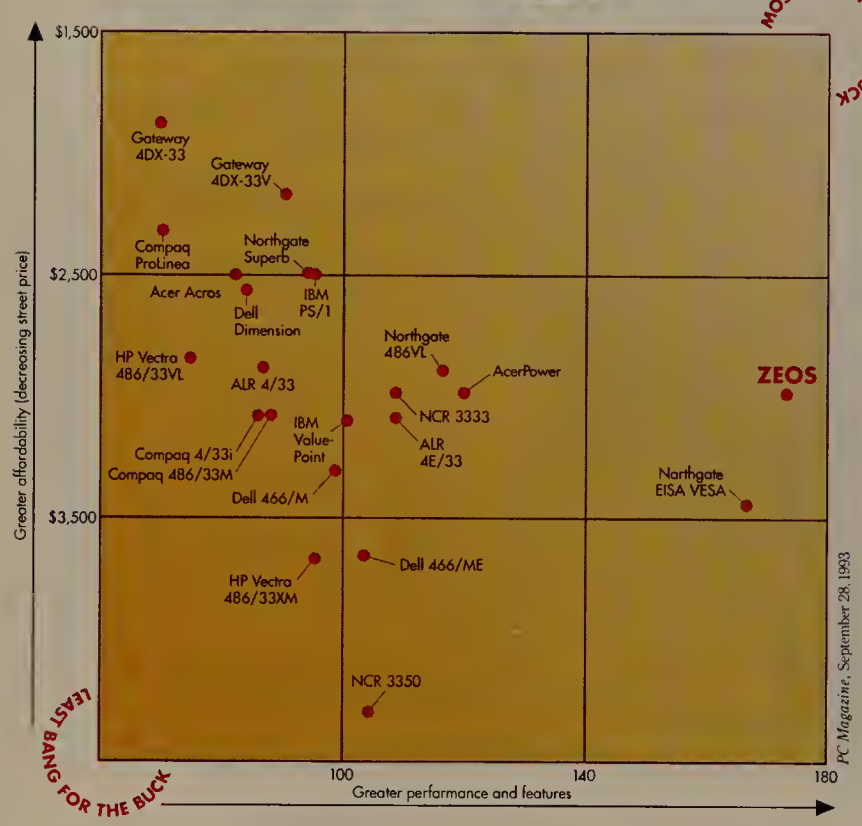
PC MAGAZINE REVEALS:

The Computer That Gives You The Most Bang For The Buck.



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Others pale in comparison. There's no way to dispute it! The results are in, and the ZEOS Upgradable 486DX2-66 is "the overall performance winner."

PC buyers expect low prices, top-quality, impeccable performance and prompt support. Basically, they want the most bang for their buck. *PC Magazine* recognized this and compared value-line PCs with more traditional systems to see if they were "truly good values or stripped-down machines trying to pass for good buys." The results are overwhelmingly in ZEOS' favor. In fact, *PC Magazine* said: *"ZEOS doesn't sell a separate value line, but the flexibility of its main system may be the least confusing solution of all."*

intel inside

Stacked against Gateway, Dell, Compaq, IBM and others, ZEOS stood alone. Using the benchmark tests as a guide, *PC Magazine* made these conclusions:

"As DOSmark scores are heavily weighted for processor and hard disk performance, the ZEOS garnered the first-place position in that category as well."

"The clear winner is...the ZEOS Upgradable, which turned in an incredible score of 55.01 megapixels per second."

"The real highlight among tested hard disks was the Seagate ST3600A, which has 12-ms access time and 256K of built-in cache. The ZEOS 486DX2-66 Upgradable's hard disk performance was almost 31 percent above the average in this roundup."

Of the *"systems that demonstrated the best agility under strenuous exercise of all their components... ZEOS (scored) 26 percent above average."*

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- Supports an external SVGA color monitor with simultaneous display capability.
- 486SL version includes 3.3V technology for added battery life, and built-in math coprocessor.
- Replaceable and rechargeable NiCad battery.
- 640 x 480 VGA backlit LCD display, 9.5" diagonal, supporting up to 64 shades of gray.
- Unique tilt and swivel display.
- 81-key keyboard with built-in mouse key, "inverted T" cursor keys and dedicated Home, PgUp, PgDn, and End keys.
- AC adapter with range from AC110-240V to DC.
- Power-saving features.
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- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

386SL Freestyle: $1295
Lease $55/month
486SL Freestyle: $1695
Lease $61/month
- 2MB RAM (386SL); 4MB RAM (486SL)
- 60MB IDE hard drive (386SL); 120MB IDE hard drive (486SL)
- Microsoft DOS 6.2

PACKAGE 2

386SL Freestyle: $1795
Lease $65/month
486SL Freestyle: $1995
Lease $72/month
- 6MB RAM (386SL); 4MB RAM (486SL)
- 120MB IDE hard drive (386SL); 180MB IDE hard drive (486SL)
- Custom nylon carrying case
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11

PACKAGE 3

386SL Freestyle: $2295
Lease $83/month
486SL Freestyle: $2495
Lease $90/month
- 10MB RAM (386SL); 8MB RAM (486SL)
- 180MB IDE hard drive (386SL); 260MB IDE hard drive (486SL)
- Internal 2400 bps V42 bis modem with 9600 bps send/receive fax
- Custom leather carrying case
- Extra battery
- External charging stand
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11

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FS-PCW-9401

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- 25MHz 80386SL or 80486SL Intel CPU.
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- 256K (386SL) or 512K (486SL) video RAM.
- 486SL version includes 3.3V technology for added battery life, PI local bus for Windows acceleration, high-speed floppy drive controller, built-in math coprocessor.
- Supports simultaneous display with an external SVGA color monitor.
- Replaceable and rechargeable NiMH battery.
- 80-key keyboard with embedded numeric keypad and easy-to-use built-in trackball.
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- FCC Certified Class B.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

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486SL Contenda: $1495
Lease $63/month

- 2MB RAM (386SL); 4MB RAM (486SL)
- 80MB IDE hard drive

PACKAGE 2

386SL Contenda: $1295
Lease $55/month

486SL Contenda: $1795
Lease $65/month

- 4MB RAM
- 80MB IDE hard drive
- External 3.5" floppy disk drive
- Microsoft DOS 6.2 and Windows for Workgroups 3.11. Plus Lotus Organizer.

PACKAGE 3

386SL Contenda: $1595
Lease $67/month

486SL Contenda: $2195
Lease $79/month

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- 80MB IDE hard drive
- External 3.5" floppy disk drive
- Custom leather carrying case
- Extra battery
- Internal 96/48/24 send/receive fax modem
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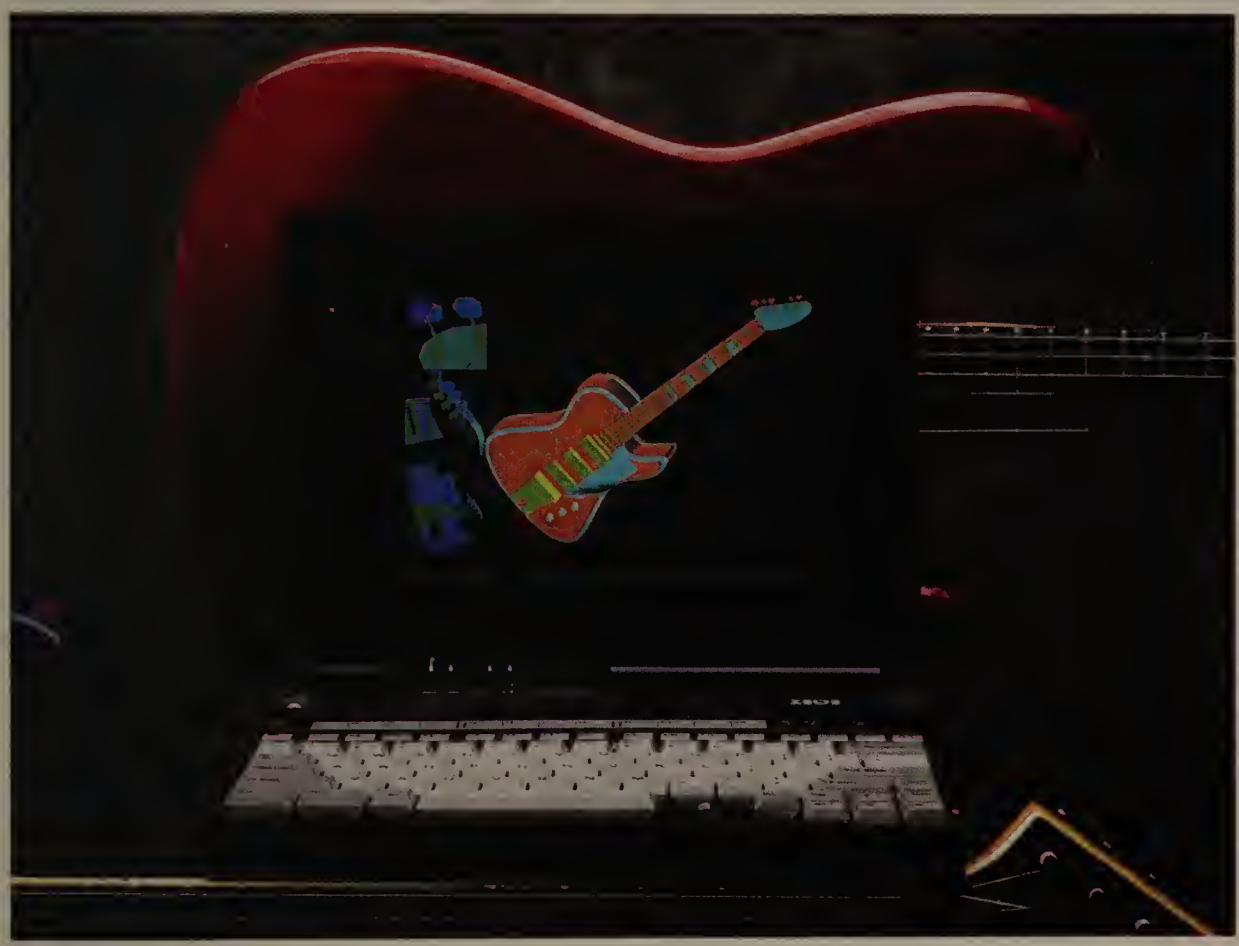

With color and power you can't beat, the ZEOS ColorNote 486 is the only color notebook worth taking note!

We started with a reliable 486SX Intel processor running at 33MHz. Then we loaded it with enough memory and power to run Windows: 4MB or 8MB RAM (expandable to 20MB), an 80MB, 120MB or 170MB IDE hard drive and an 8K built-in cache. And, we added local bus video for super-fast video performance.

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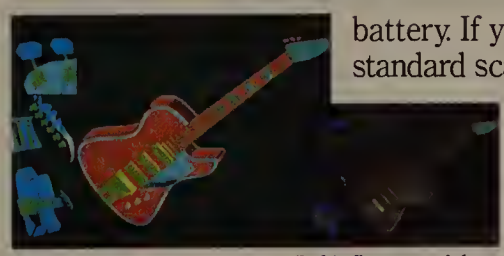

ZEOS dual scan screen (left) fires up rich, vibrant colors while standard passive matrix screen (right) produces faded and dull colors. Photos are not retouched.

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- 33MHz 486SX Intel processor.
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- IDE hard drive expandable to 170MB.
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- Internal 3.5" 1.44MB floppy disk drive.
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- 512K video RAM.
- Local bus video for super-fast video performance.
- Display: 640 x 480 dual scan color VGA backlit LCD, 9.4" diagonal, up to 256 colors.
- Supports an external SVGA color monitor at resolutions up to 1024 x 768.
- 82-key keyboard with embedded numeric keypad and 12 dedicated function keys.
- Built-in trackball.
- Replaceable and rechargeable NiMH battery.
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- Full power management features include Low Power mode and programmable Stand-by features.
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PACKAGE 2

ColorNote 486: $2695
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- 4MB RAM
- 120MB IDE hard drive
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

PACKAGE 3

ColorNote 486: $2995
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- 170MB IDE hard drive
- Custom leather carrying case
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- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

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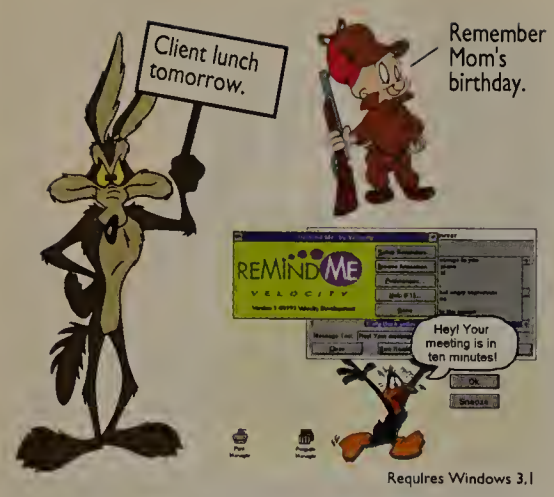

Requires Windows 3.1

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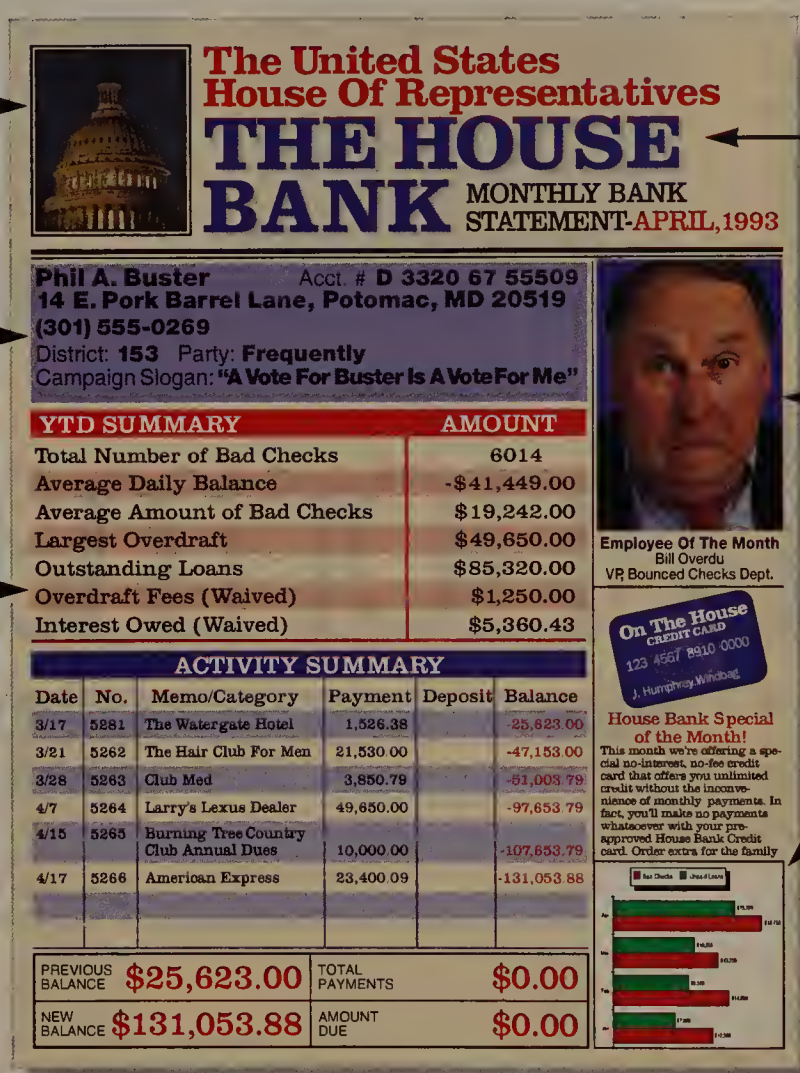

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Total Number of Bad Checks	6014
Average Daily Balance	-$41,449.00
Average Amount of Bad Checks	$19,242.00
Largest Overdraft	$49,650.00
Outstanding Loans	$85,320.00
Overdraft Fees (Waived)	$1,250.00
Interest Owed (Waived)	$5,360.43

ACTIVITY SUMMARY

Date	No.	Memo/Category	Payment	Deposit	Balance
3/17	5281	The Watergate Hotel	1,526.38		-25,623.00
3/21	5262	The Hair Club For Men	21,530.00		-47,153.00
3/28	5263	Club Med	3,850.79		-51,003.79
4/7	5264	Larry's Lexus Dealer	49,650.00		-97,653.79
4/15	5265	Burning Tree Country Club Annual Dues	10,000.00		-107,653.79
4/17	5266	American Express	23,400.09		-131,053.88

PREVIOUS BALANCE	$25,623.00	TOTAL PAYMENTS	$0.00
NEW BALANCE	$131,053.88	AMOUNT DUE	$0.00

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Circle 78 on Reader Service Card

The Pentium Has Landed?

When the first Pentium PCs were introduced six months ago, all but the most power-strapped users applauded their stellar performance and then shrugged them off as unaffordable. Sure, vendors claimed that Pentiums were nearly twice as fast as 486DX2-66s, but who wanted to pay $8000 or $10,000 for a PC? Not my boss, and probably not yours. True, the high prices reflected the scarcity of new Pentium chips. And most companies selling the first Pentiums positioned them not as desktop PCs but as servers, which made the prices a bit easier to swallow. Using a different tactic, Advanced Logic Research attempted to woo Pentium buyers with a comparatively low price. Its Evolution V started at $2495, but that bought you only a case and a motherboard; a few key components—hard disk, graphics board, monitor—were extra. In all, you didn't need to consult a Scrooge-like CFO to know that Pentiums didn't make much sense.

That's on the verge of changing, as we report in two stories this month. First, in "PCs for the Power Hungry," a Pentium PC earns our Best Buy award for the first time. Equally notable, this Best Buy Pentium comes from IBM, a PC maker that *PC World* has chided in the past for excessively high prices. But no more. The company's ValuePoint P60D, our reviewers found, delivers better value than the Pentiums we reviewed from ALR, Compaq, and Acer, and it beats out 15 fast 486DX2-66s as well.

Just how did IBM's Pentium win this Best Buy? The ValuePoint P60/D clocked in about 25 percent faster than the NEC Image 466es, the fastest 486DX2-66 reviewed. The ValuePoint is priced at $4999, which includes 16MB of memory, a 424MB hard disk, and PCI local bus. The NEC costs $3510, and that is with 8MB of memory, a 420MB hard disk, and VESA local bus. For about a 25 percent price premium—roughly $1000 more, adjusting for the additional RAM—the IBM ValuePoint gives you about 25 percent more performance. That's starting to make sense.

Down-to-Earth Prices

Expect the Pentium advantage to grow, and expect IBM's price to drop as it works to hold on to its lead. Close on the P60/D's heels are new Pentiums priced at less than $3500 and even $3000. As we report in the lead story in *Top of the News*, a slew of lower-priced Pentiums will be available by the time you read this: Gateway's low-end Pentium starts at $2995; its high-end (with 16MB of RAM, a 528MB hard drive, PCI local bus, and a 17-inch monitor) starts at $3995. New Pentium PCs from Austin, Blackship, ALR, Compaq, NEC, and Dell will be priced competitively with Gateway's.

There's one catch: You may have a hard time getting one. An adequate supply of these lower-priced Pentium PCs hinges on a plentiful supply of Pentium chips and the ability of vendors to engineer reliable, high-performance systems on schedule. The seven Pentiums we tested for this month's news story barely straggled into the PC World Test Center in time. And some Gateway customers, for instance, face waits of four to seven weeks for Pentiums first advertised in mid-October.

Still skeptical about ordering a Pentium or actually getting one delivered? All this jockeying at the high end should lead to lower prices for 486DX2-66s and Blue Lightning systems—mainstream PCs with plenty of power, in plentiful supply, and priced right for most offices today.

An Affordable Upgrade

At the other end of the price spectrum, what could be more affordable than a simple DOS upgrade? It may cost less, but it's not simple. In "DOS vs. DOS vs. DOS," we examine the price you'll pay—in more ways than one—for MS-DOS 6.2, PC-DOS 6.1, and Novell DOS 7. Using prerelease versions of MS-DOS and Novell DOS, writers Van Wolverton and Brett Glass examine the issues: compatibility with existing DOSes (read MS-DOS), enhanced features like task switching and networking, robustness of utilities, and support.

Expect IBM's price to drop. Close on the P60/D's heels are new Pentiums priced at less than $3500 and even $3000.

Their conclusion? Sounds like advice from your broker about investing: If you're averse to risk, choose safety over gain; and if you're a gambler, trade risk for potential reward. Wolverton and Glass agree on the choice for the chicken-hearted, but diverge from there. So first assess your level of risk-taking, then read their report for advice.

A Lotus Tips Extravaganza

If you're running any Lotus Windows app, we have plenty of advice for getting the most out of it in "50 Tips for the Windows Suite." And if you're running any version of 1-2-3 and want to get your life together in 1994, be sure to check out "Start the Year Right With 1-2-3 Organizers."

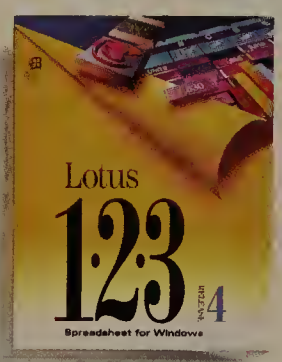
Cathryn Baskin

Cathryn Baskin, Editor

MICHELE CLEMENT

THE ME GENERA
THE WE SPR

1-2-3 RELEASE 4 BRINGS IT ALL TOGETHER.



Once again, the world of spreadsheet users is coming together around Lotus® 1-2-3.®

The new 1-2-3 Release 4 for Windows™ has made using a spreadsheet easier, faster and dramatically more productive for everyone, based on hundreds of advancements in functionality and usability.

In fact, a recent independent study reported that 67% of current Microsoft® Excel users surveyed would prefer to be using 1-2-3 Release 4.†

But it's the Working Together® features of 1-2-3 that are redefining the spreadsheet. These unparalleled workgroup capabilities are not only improving the way people work with spreadsheets, they're improving the way people work with each other.

> *Users who often collaborate on developing and refining worksheet data...will find Release 4 indispensable.*
> PC/WEEK, 5/3/93

CONNECT ON A BASIC LEVEL.

The first level of Working Together is networking. Every 1-2-3 package can be installed on the network right out of the box. No special version is required. And because 1-2-3 and all other Lotus

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TION DISCOVERS EADSHEET.

Windows applications are mail-enabled, you can quickly and easily share your data with others on the network. And vice versa.

COLLABORATE ON A HIGHER PLANE.

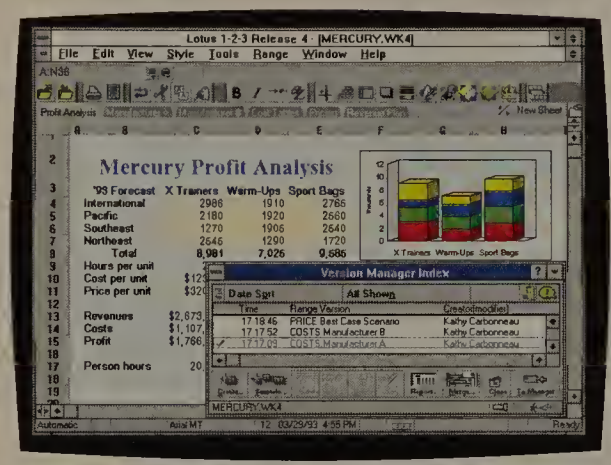
The real power of Working Together comes from 1-2-3's advanced Versioning technology and group editing powers. These are features no competitor can match.

With Version Manager™ technology, workgroup members know who made what contributions to a file, when and why. Each group member can save, label, track, mix, merge and comment on ranges, worksheets or entire files. And do it all without overwriting existing data or making multiple copies of the same file. Now we're sharing ideas, not merely sending spreadsheets.

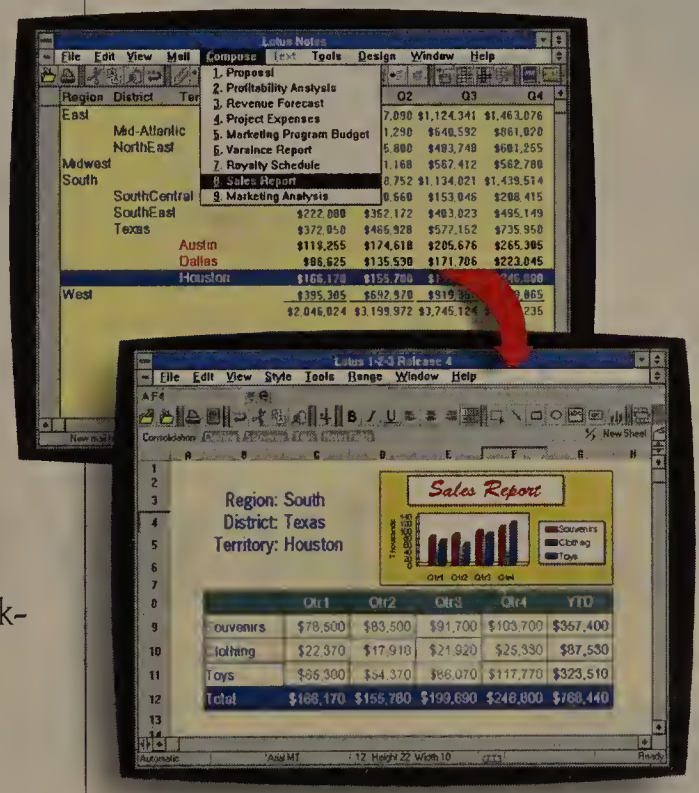
All this can be done over LANS, e-mail or even diskettes for that matter.

RAISE YOUR GROUP CONSCIOUSNESS.

Working Together with 1-2-3 can be further enhanced with Lotus Notes,® the market-leading groupware. Notes allows different users to access, track and share work on the same spreadsheet at the same time, with the full security of a Notes database. And it's all updated in real time. As a result, teams can collaborate to perform everyday business processes in ways never before possible. Ways that are faster and much more productive.



Version Manager lets each member of your workgroup know who made what changes to a file, when and why.



With Notes/FX, you and your workgroup can store, distribute, and manage 1-2-3 data in Lotus Notes. And with a simple click of your mouse, you will instantly be launched into 1-2-3 and the underlying spreadsheet to get the specifics.

And with Notes/FX,™ you can not only access and share 1-2-3 data in a Notes database, you can double click in the Notes form and instantly be launched into the underlying spreadsheet in 1-2-3. Now you've got the spreadsheet power to edit the data.

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from ALR. As the newest member of ALR's EVOLUTION V family, this system delivers true record-breaking 60 or 66-MHz Pentium processor horsepower. Power that has earned the ALR EVOLUTION V family top honors from BYTE, InfoWorld, and PC/Computing. Engineered to maximize the Pentium processor, this powerful system boasts a 64-bit cache/memory design with your choice of 32-bit local bus architectures; VESA VL or PCI.

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Pentium 60-MHz	YES	YES
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VESA Local Bus IDE	YES (VL Systems)	NO
Integrated SCSI-II	YES (PCI Systems)	NO
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ALR bests three other 60MHz Pentium systems

Winstone 94 Version 1.0

Advanced Logic Research Inc. Evolution V™	82.2
AST® Research Inc. Premmia™ LX P/60	72.6
Compaq® Computer Corp. Deskpro™ 60/M	69.2
IBM® ValuePoint™ P60/D	75.9

Longer bar indicates better performance.

PC Week November 1, 1993 page 21 Winstone 94 measures overall system performance, using one script for each 12 popular Windows applications. It computes the amount of time each script takes to finish, and uses those times to produce an overall score Timed results are weighted based on the relative market share of each 12 applications.

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Circle 9 on reader service card

Getting Online, Better Than ProgMan, Offended UNIX Devotee

In the Nick of Time

Thank you for "The Best of Online Services" in October. It came just as I had decided to join America Online. I had spent six or seven weeks investigating all the online services available in order to make that choice. But your article provided all the information I needed in one place.

I joined America Online for two reasons: excellent E-mail, and PC World Online!

David Trevino via PC World Online

Higher Rates for Writers

In "The Best of Online Services" in October, George Campbell said that he sent a file to his client on America Online at 9600 bps. But America Online says it offers only 2400-bps service at this time, though it is considering offering 9600 bps. What gives? Do magazine writers get higher bps rates?

Jeffrey Boone via PC World Online

Author's response: Ooops! Actually, I did sign on to America Online at 9600 bps. Because *PC World* system operators were part of the team that beta tested 9600-bps access, I was given a list of 9600-bps access numbers. I thought those numbers were available to all subscribers, but I have since learned that wasn't the case.

I hope America Online will make 9600-bps service generally available soon. —*George Campbell*

Love of Plug-In

Big thanks to Contributing Editor Steve Bass for all the great information on Windows utilities in the September *Home Office*. I had already stumbled upon Trash Manager, but I've been using Plug-In for about 3 hours now, and I'm in love. It's got all the features that I always wished ProgMan had, and it really does make life nicer and more Macintoshlike (for a not-so-closeted Mac fan).

Kathryn S. Burke via America Online

Preference for UNIX

I object to Phil Lemmons' statement in October *Letters* that "UNIX has never been one operating system with one interface to attract software developers." Pardon my indignation, but this is not a description of the UNIX that I've known for years.

UNIX has been around far longer than MS-DOS. It is the backbone of Internet, with millions of users worldwide. UNIX versions of WordPerfect have existed since that program's inception. The list of PC software available under UNIX not only fills volumes, it includes some of the best business and scientific software. Finally, to say "there are millions more Macs than UNIX workstations" is absurd. Quite the contrary is true.

The unspoken implication that Windows is now the user interface of choice ignores the large cadre of computer users who have no interest in Windows.

Louis F. Mueller, Tallahassee, Florida

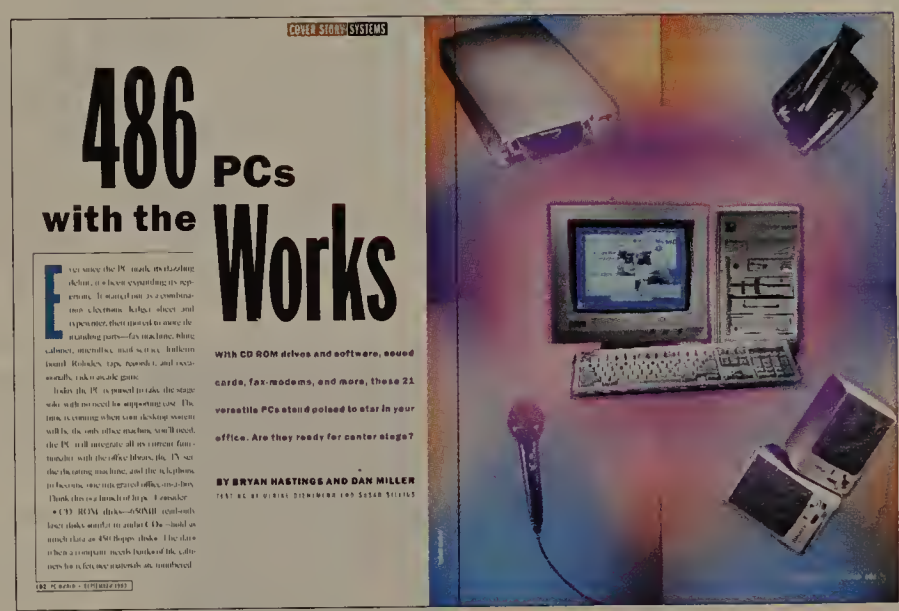
Glaring Deficiency

I want to commend your vigorous evaluation of the systems in "486 PCs With the Works" in September. But I need to point out one glaring deficiency. With the sophisticated measurements you apply to many of a computer's attributes, it amazes me how little quantitative measurement you apply to the monitor.

In your evaluation of the Gateway 4DX2-66V, you note, "One nice bonus: a 15-inch CrystalScan monitor." Apparently, all you did in your evaluation was read the label. I recently purchased one of these machines, and when I set up the monitor, I noticed that it didn't seem any bigger than the 14-inch CrystalScan I have at work. I got out the tape measure and discovered that the actual video screen on the 15-inch monitor is 13 inches. The video on my 14-inch monitor at work is 12.5 inches.

In short, don't believe everything you read on the label.

Earle Greene, Perry, Florida


COVER STORY SYSTEMS

486 PCs with the Works

With CD ROM drives and software, sound cards, fax-modems, and more, these 21 versatile PCs stand poised to star in your office. Are they ready for center stage?

BY BRYAN HASTINGS AND DAN MILLER

Editor's response: Mr. Greene has an excellent point. Not all 15-inch displays are created equal. Vendors base the published size of their monitor screens on the size of the monitor's cathode ray tube. But then they put a plastic bezel around the outer edge of the tube, which can reduce the size of the viewing screen. And you have to consider the size of the image that's actually beamed onto the screen. Image size can vary widely from monitor to monitor, depending on the monitor's ability to handle the wide spectrum of scanning frequencies. In future system and monitor reviews, we plan to evaluate visible screen size and, if possible, actual image size.

Help Me Take Out the Trash?

I would appreciate your advice in determining the best way to dispose of obsolete computer equipment. I bought a NorthStar system in 1982. It cost about $12,000 then but has almost no value now and is taking up space in my

ROBERT CARDIN

basement. I'd like to know if there's a reasonable alternative to leaving it on the curb for the trash collectors. I'm not looking for any financial gain, just to dispose of the equipment in the most responsible manner.
Robert A. Kadison, New Rochelle, New York

Editor's response: A number of organizations are set up to accept donations of used PC equipment, which they give to needy groups in the United States and throughout the world (see *Consumer Watch*, December 1993). If none of them can use your old computer, try checking locally for a firm that salvages recyclable materials.

An Excellent Imperative

Thanks to Randy Ross for "The Telecommuting Imperative" in September's *Top of the News*. It is an excellent article, highlighting all the benefits of telecommuting: productivity, profitability, personnel retention, and compliance with environmental legislation. In the Shenandoah Valley, 75 miles from Washington, D.C., the Winchester–Frederick County Economic Development Commission has established a telecommuting center. Equipped with 100 workstations, the center will support some of the several thousand workers who commute daily to offices in the capital area to work on computers.

This telecommuting project is a leap forward in preserving the famed but fragile Shenandoah Valley and returning some semblance of family life to supercommuters who live here.
Dan Malone, Winchester–Frederick County Economic Development Commission, Winchester, Virginia

Jump-Starting Windows

I found "Turbocharging Windows" in October very informative. I especially enjoyed the inclusion of VidTech's GraphMax LB. I applaud the unique method you chose to test the products. Comparing the way accelerator boards perform under different applications provides a much broader view to help the buyer make a decision.

I do have one complaint. You say that VidTech uses jumpers to set the refresh rate. This is not true. The board does have jumpers, but they are factory set and have nothing to do with the refresh rate. Our refresh rate is set through software.
Walter J. Stull, Chief Operating Officer, VidTech Microsystems, Minneapolis

Quicken Wronged

I would like to correct a statement in "Quicken: More Than Checks" in October's *Top of the News*. The article says that Quicken doesn't calculate an annualized return for individual securities from the date of acquisition. This isn't true!

Quicken's standard investment performance report calculates annualized rates of return by individual securities or by your entire investment portfolio.
Jacqueline Maartense, Product Marketing Manager, Intuit, Menlo Park, California

Printer Dispute

In August's *New Products*, "Photo-Quality Color Printing Hits a Brilliant Price" inappropriately characterizes the technology used in the Kodak ColorEase PS printer as "near dye-sublimation quality."

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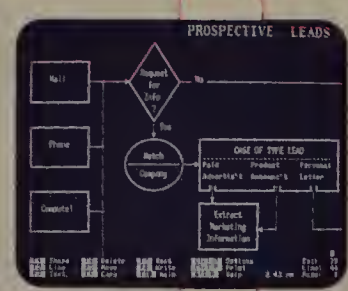

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Circle 93 on reader service card

Perhaps you'd like to consider a more rational approach to choosing a portable computer system.

As any decision maker knows, making decisions is tough. Especially the big ones. At least we can make the job of choosing a portable computer system a little easier by introducing a rather remarkable item: the AST Bravo NB. It's compact, lightweight, and comes with local bus graphics for speed. An integrated trackball. Complete PCMCIA connectivity. Even dual scan color. In fact, the Bravo NB has most of the significant features found in other advanced notebooks, with one notable exception: Ours has a reasonable price tag. As it starts at $1,699,* we'd understand if you lost your power of rational thought and acted impulsively. (Which is why we've included our phone number.)

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Dye-sublimation terminology came about because the dyes used in the early days of this technology were characterized as sublimal. As the process became better understood, however, it was learned that the dyes transfer by diffusion. Thus the dye-transfer process in printers with resistive thermal printheads is more accurately described as dye diffusion.

The Kodak ColorEase PS printer uses the same technology as the award-winning Kodak XL 7700 printer introduced in 1990 as well as all the other commercially available resistive-head dye-transfer printers. A better statement would describe this class of printer as near photographic.

David A. Johnson, Daniel J. Harrison; Eastman Kodak Co., Rochester, New York

Corrections and Clarifications

In October's *New Products*, we stated that QEMM 7.0 freed up 638K of RAM. Actually, it frees up only 631K.

October's *New Products* also included an incorrect list price for Harvard Graphics 2.0 for Windows. The correct price is $395.

The table on page 194 of "NT Applications: The Waiting Game" in the October issue should have indicated that Great Plains Software plans to support NT on both the Pentium and DEC Alpha platforms.

In the table on page 218 of "Turbocharging Windows" in October, the lengths of the bars represent the results inaccurately. The numbers are correct.

The feature set of Ami Pro 3.01 was inaccurately represented in a chart on page 76 of November's *Top of the News*. Ami Pro supports context-sensitive icon bars, personal and shared style sheets, automated templates, individually identified annotations, individual configurations for LAN users, and the inclusion of envelopes in a mail merge. In addition, we should have noted that while Ami Pro does not offer right-click context-sensitive menus, it does offer right-click formatting dialog boxes for some features. You can also customize the keyboard under Ami Pro by assigning macros to keyboard shortcuts. Finally, Ami Pro supports the ability to draw on a page via a graphics frame, and you can rotate text.

PC World regrets the errors.

PC World *welcomes your responses and ideas.* *See page 12 for contact information.*

The notebook industry's first 4mm, full-travel keyboard with the look and feel of a desktop system.

New brilliant Active Matrix display – 640 x 480 VGA with high-speed video system for lightning fast graphics.

Built-in Windows plus 50MHz 486DX2 processor (with coprocessor) for blazing performance.

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If you've been waiting for an active matrix color notebook with true desktop power, your wait is over. Thanks to the new TravelMate™ 4000E WinDX2™/50 Active Matrix Color notebook from Texas Instruments.

50MHz DX2 processor with coprocessor provides desktop performance in a notebook.

With 256 brilliant, simultaneous colors and a 50MHz 486DX2 processor, this powerhouse doesn't just whisper color, it screams it.

And yet the TravelMate 4000E weighs a mere 6.2 pounds, including battery. This convenient size and weight gives you more performance* than the leading 486 notebooks. And the industry's first 4mm, full-travel keyboard gives you the feel of a desktop.

Of the leading active matrix color notebook manufacturers, only TI offers the desktop performance of a 50MHz DX2 processor.

Active Color Notebook	*Weight (lbs.)*	*486 Processor*	*Speed*	*Coprocessor*
TravelMate 4000E	**6.2**	**DX2**	**50MHz**	**Yes**
Toshiba T4600C	6.9	SL	33MHz	Yes
Compaq LTE Lite 4/33c	6.5	SL	33MHz	Yes
IBM ThinkPad 720C	7.6	SLC2	50MHz	No

Thanks to built-in Windows 3.1 and useful TI utilities, you can power up to Windows in just 15 seconds. And the TravelMate 4000E is Windows NT-compatible. With 4MB of main memory, expandable to 20MB, you're ready for today's and tomorrow's software.

If you work on the go, you'll also go for the rugged 200MB hard disk drive, the high-speed video bus and 1MB of video RAM, as well as the full range of connectivity options – snap-on modules for Ethernet® LANs, SCSI-compatible devices and an internal 14,400 bps V.32 bis modem with 9,600 bps send/receive fax capability.

For more information about the only 486 notebook family that won five Editor's Choice awards in PC Magazine's August issue, call *1-800-527-3500*.

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50MHz Monochrome

50MHz Active Color

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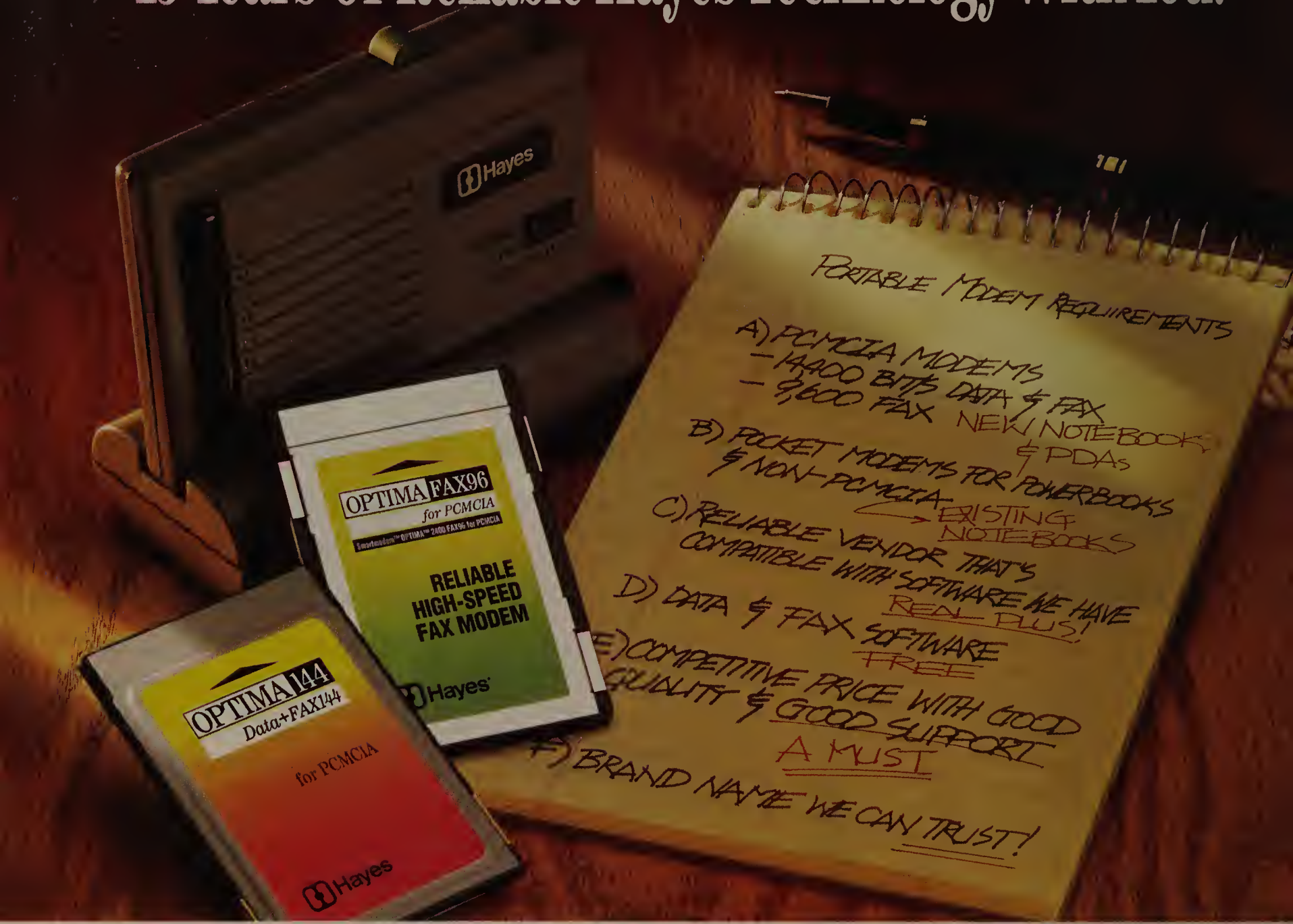

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New CDs Let You Try Software On for Size

How many times have you been dazzled by the superlatives on the outside of a software package, and then taken the box home only to find that the product didn't live up to the hype? Well, soon you may be able to try a new application on your own PC *before* you surrender your credit card.

In November, a handful of companies started offering CD ROM disks containing dozens of encrypted applications, from mainstream business productivity packages to games and utilities. From the sound of things, the CDs will be available just about everywhere by year-end. You'll likely find them on display near checkout registers (like candy and other impulse items) at national chains such as CompUSA, Software City, and Software, Etc. Though many of the disks carry a suggested retail price of around $10, some stores will probably give them away as a promotion. The disks will also be bundled with CD-ready PCs from IBM, Compaq, Gateway, and others, as well as with CD ROM drives and multimedia upgrade kits from such notables as MediaVision and Creative Labs.

Though the precise implementation varies, all the CDs follow some basic principles: You'll get to review product literature and, in many cases, try the software you're considering (though the first CDs may include more marketing literature than usable software). If you find something you like, you call an 800 number and give your credit card number along with a CD-specific code to your salesperson, who gives you a second code that unlocks the application.

Developers will take a couple of approaches to entice you to try their software. One is to include a "limited version" of the package on the disk—say, without the print or save functions; another is to give customers full use of the package but limit the number of times—or the length of time—they can use it. You'll probably see a range of approaches within any given disk.

No Shortage of Players

Right now at least seven companies will offer general-interest disks: Softbank, which includes distributor Merisel among its investors, is selling On-Hand; Apple will resell Windows applications as part of its Software Dispatch program; IBM has its CD Showcase; distributor Ingram-Micro is offering CD-Access; TestDrive Corporation has SuperStore; and InfoNow is bundling its CD with various OEM systems. Gateway packages the InfoNow CD as Store-on-a-Disc, and IBM packages it under the name Options by IBM.

Start-up KidSoft of Los Gatos, California, is targeting its CD at children and their baby boomer parents. In October the company released the first edition of its Club KidSoft CD and accompanying magazine/catalog. The combo is sold on newsstands and by subscription and features educational software for children 4 to 12 years old. Customers can order software that's on the CD and products listed in the catalog.

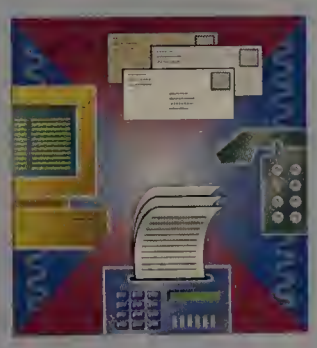
Software test drives won't be limited just to PC users with CD ROM drives, though. In addition to its CD ROM product, IBM is now marketing a floppy-disk–based encryption technology to software developers. Whereas the CDs will feature multiple products, the floppy disks will include just one "locked" software package that you'll be able to try out and then order, much as you would the applications on CD.

At one level, these products all work and sound about the same, but there are important differences among them. Most critical, perhaps, is which applications are included on the CDs and the degree to which customers can use the individual applications, rather than just reading marketing literature or going through a canned tutorial.

In its most useful form, a CD will

By Roberta Furger

KEEPING UP



Eco-conscious PC users may want to take a look at Eco Tech's Eco Disc recycled floppies. Eco Tech (713/444-6074) buys unused disks from software and hardware companies, erases them, checks them for viruses, and reformats the disks for Macs and PCs. Costs of the disks vary, depending on the quantity purchased...There *is* life after Chapter 11. Some good news from CompuAdd Computer. The Austin, Texas, company emerged from Chapter 11 bankruptcy in November, four months after filing...Shopping for a Better World couldn't be easier with the release of a $39.95 software package of the same name from Heartbeat Software of Waltham, Massachusetts. The software rates thousands of consumer products based on the manufacturers' policies and practices in areas such as the environment, charitable contributions, community involvement, and workplace issues... A new California law protects consumers from being left out in the cold if their computer repair company goes under. The law, which covers firms doing business in California, requires companies to demonstrate financial solvency or to take out an insurance policy to cover the cost of all outstanding contracts. Pennsylvania, Florida, North Carolina, Virginia, and Connecticut have enacted or are considering similar legislation.

ROBERT HOLMGREN

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include all the major players in any given product category (as well as a lot of the not-so-well-known packages). You'll go through each product and decide which meets your needs—at your own pace, and on your own PC. It's a revolutionary concept. Not only does it give customers the ultimate control over what they buy, it also (in theory, at least) levels the playing field for all developers, big and small.

Several CD producers have lined up Borland, Lotus, and WordPerfect, but so far only a few have signed even limited agreements with Microsoft. Softbank and InfoNow have contracted with the software giant, but under the terms of these agreements, all Microsoft products must be on a separate disk from that of competitors.

Microsoft is evaluating other CD ROM options but needs to test the security features of each technology fully before signing on, says Mike Negrin, director of distribution strategies.

As for including "test-drivable" software, Negrin says he's not convinced that users will want to try a variety of packages before choosing which one to buy.

Details, Details, Details

Besides finding out what software is available for a test drive, you'll need to consider a handful of other issues. First, check out the version number of the application you're evaluating. Most of the companies will update their disks quarterly, so it's possible that the CD and shrink-wrap versions will be out of sync at times. Companies are still working out the details on how they'll handle updates, but most expect they'll make arrangements to ship the latest version once an order is placed.

Documentation is another issue. InfoNow and TestDrive are shipping documentation and original floppy disks automatically to all software buyers. Other companies will send documentation, but they'll charge a shipping and handling fee.

Clearly, there are bugs—as well as a few other annoyances—to be worked out. The first CD releases won't include interactive copies of all the packages available for unlocking. Instead, they'll include some sort of limited demo or just the marketing literature for you to review. Over time, the number and variety of products should increase, as should the interfaces and value-added services provided by the CD producers. Already some companies are talking about differentiating their products with such extras as software giveaways and targeted offerings for special niche markets.

Although some retailers are more than a little worried that the CDs will cut into their sales, it seems doubtful that CD shopping will ever completely replace browsing for new titles at your local store. But CDs give PC users the first real opportunity to evaluate software *legally* and make sure it meets their needs before they spend their money.

Shop Talk

Cheaper But Not the Same

When my Panasonic KX-P1124i dot matrix printer started having problems, I called the toll-free tech support number. I waited on hold for about 10 minutes before I was connected to someone who could discuss my problem. As I described what was wrong, he cut in and asked if I had a Panasonic ribbon in my printer. I didn't; I was using a generic brand. He yelled at me and said my warranty was no good if I wasn't using a Panasonic ribbon. Next, I took my printer in to an authorized service center. As soon as I put the printer on the counter in the service center, the representative told me he couldn't work on it unless it had a Panasonic ribbon and offered to sell me one for $18. Nowhere in the Panasonic manual does it warn against the use of generic ribbons. Computer users love to shop around for a good deal. If we can get a ribbon at half the price, we'll do it if no one tells us about the dangers.

Maggie Trapasso, Rock Hill, South Carolina

Editor's note: Ron Tomczyk, public relations manager for Panasonic, confirmed that the warranty on Panasonic printers does not cover damage caused by generic products. Therefore, while you may save money if you use a generic ribbon, you risk voiding the warranty if the ribbon damages your printer. None of the printer experts we spoke with had ever heard of a ribbon damaging a printer, although manufacturers say using their own ribbons can make the printhead last longer. Still, you might want to make sure you have a product-specific ribbon in your printer when you bring it in for warranty repairs.

Trapasso's printer turned out to be cov-

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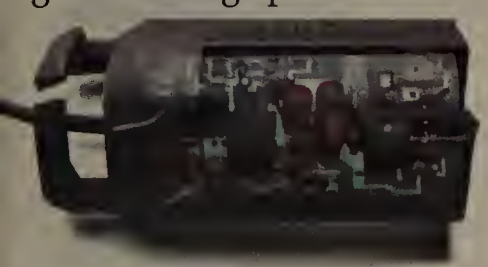

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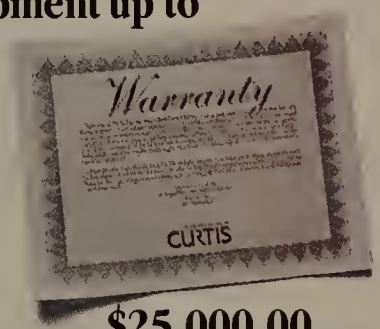

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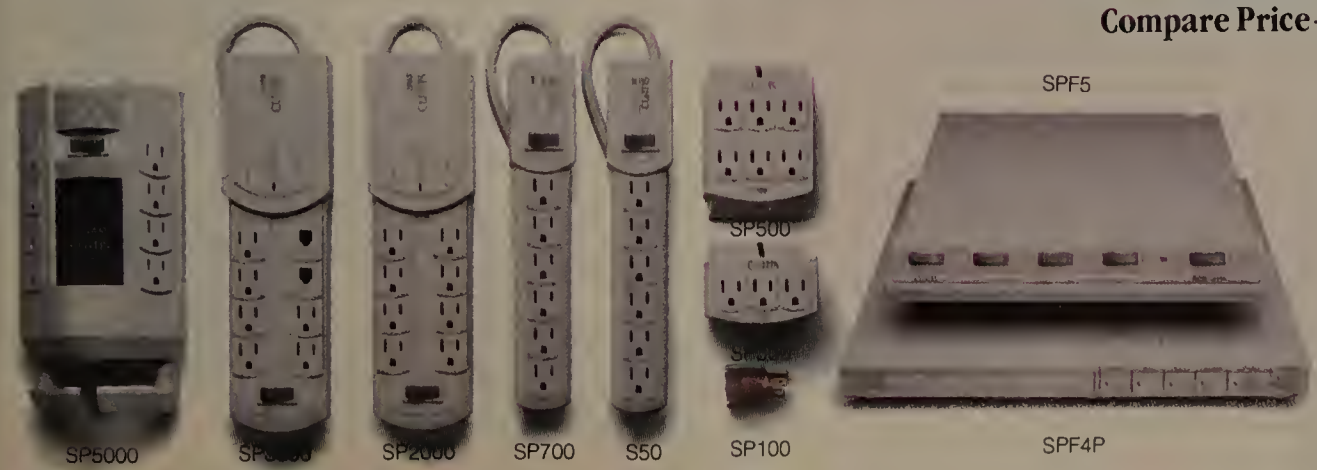

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PCW1/94

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ered under warranty, and Panasonic has promised that it will be sending her a complimentary ribbon for her trouble.

The Cost of Memory

I saw an ad in the September issue of *PC World* for a Northgate 486SX priced at $999. I immediately called to order it, but Northgate told me there was a surcharge because of a memory shortage.

Then I noticed a disclaimer in the ad—in very small print—reserving the right to increase prices. Maybe it was legal to apply the surcharge, but to do so right after the ad was published was unethical. I can't believe that a major company can't foresee pricing trends well enough to match its advertising with its costs. I must assume the company was just trying to skin a few suckers.

Andrew Moriber, Miami Beach, Florida

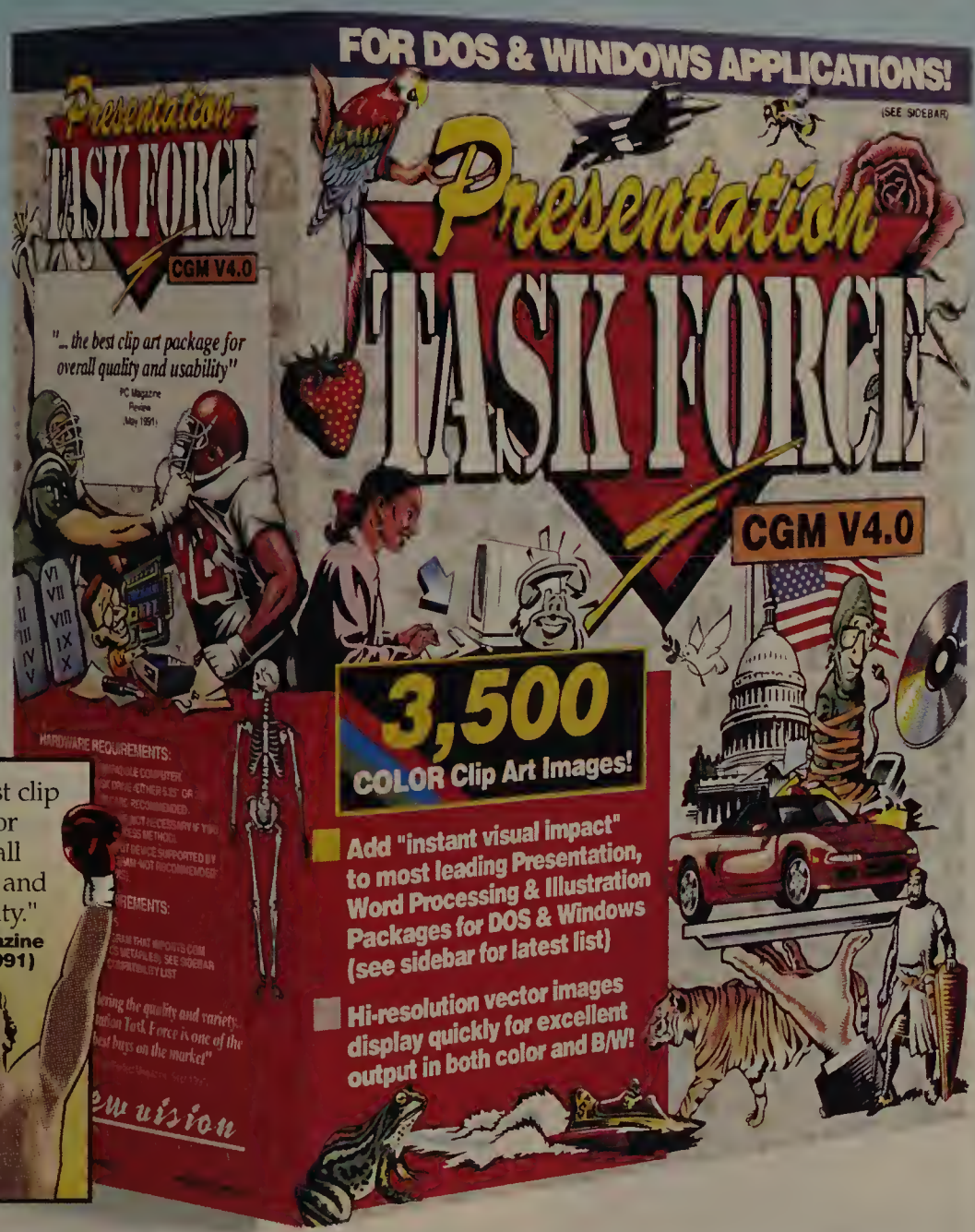
Editor's note: Mark Bolick, sales manager for Northgate, told us that the ad in question was submitted to *PC World* three or four weeks before the ship date of the September issue. Right about that time there was an explosion in the resin plant in Sumitomo, Japan, that manufactures 60 percent of the world's supply of the resin used in DRAM memory. This caused the market price for memory to double—not just for Northgate but for all computer manufacturers (see "Memory Price Madness" in the September 1993 *Top of the News*). Northgate, according to Bolick, could no longer afford to offer systems at the price quoted in the September ad. Dave Sanny, senior systems engineer at Northgate, said the company is watching the price of memory and will reduce or eliminate the memory surcharge as soon as its cost decreases.

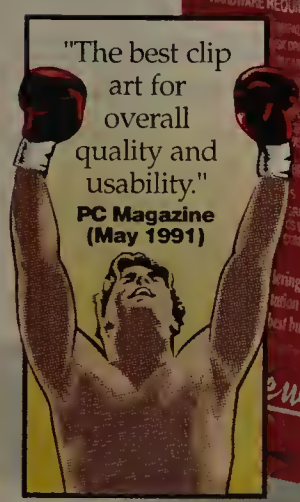
Duped?

I ordered an Ansel All-in-One Ethernet Model 1000 Parallel Port Adapter from Misco America, in Holmdel, New Jersey. It was advertised as being Novell Labs authorized, tested, and approved.

The product I received didn't function properly, so I returned the adapter to Ansel for a replacement. The second adapter functioned, but only marginally. After talking with Ansel's support staff, I returned the replacement, too. The third adapter functioned just like the second.

Finally, during a conversation with an individual from Novell technical support, I





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PC Computing (May 1992)

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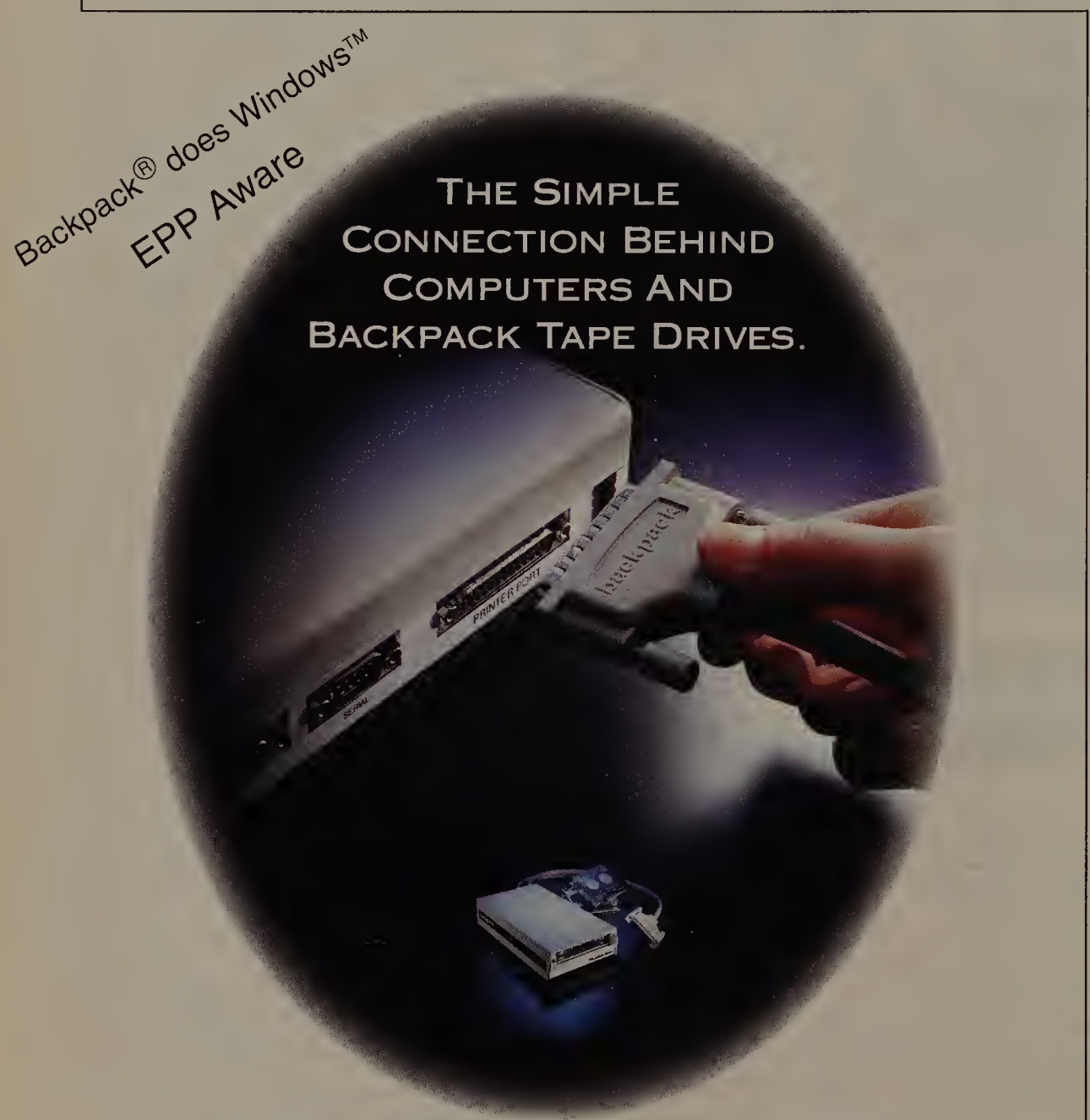
discovered that this device isn't authorized, tested, and approved by Novell. A call to Ansel confirmed this. I had been duped.

I called Misco's customer service and got a return merchandise authorization (RMA) number to send the merchandise back for credit. Then I bought a Xircom Pocket Ethernet Adapter II, which functioned flawlessly on the first try. It cost $120 more, but it works. It's troubling that it took four months to get this issue resolved, especially since it never would have occurred if Misco's advertisement had been correct.
David Smith, Bangor, Michigan

Editor's note: Misco told us that as a result of Smith's letter, it discovered Ansel had wrongly claimed this product was Novell tested and approved. Reddy Reddy, president of Ansel, told us that Ansel mistakenly printed an incorrect data sheet for its Parallel Port adapter. The product was submitted to Novell for testing but was later dropped from the product line because of difficulties in supporting it. But unfortunately, distributors already had the product and data sheet and were advertising it as Novell approved. Both Misco and Ansel apologized for the problems cause by the mistaken data sheet and the resulting ad.



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Falling Through the Cracks

MicroLogic recently refunded me the price of a MoreFonts upgrade. The refund process was more trouble than it should have been, but I got my money back. What then, you may ask, can be bugging me? The problem is, I didn't want to return the software in the first place. But, despite repeated phone calls and faxes to MicroLogic technical support and even to the sales staff, nobody ever called me back—not even to tell me that nothing could be done about my problem.

Does MicroLogic customer support exist?
Paul Rosenberg, Litchfield, Connecticut

Editor's response: We got several letters about problems getting upgrades to MicroLogic's MoreFonts. MicroLogic's marketing coordinator, Lucy Allison, apologized for the problems. She explained that in 1992, MicroLogic used a direct-mail fulfillment house to process upgrades to MoreFonts and encountered many problems resulting from the way the firm handled customer inquiries. MicroLogic has stopped using the fulfillment house and now handles all of its own support. The correct number is 510/652-5464.

Above the Call

Recently I received a direct-mail circular touting the virtues of a utility called The Disk Duplication System from Kitz Technologies in Oshkosh, Wisconsin. Being a skeptic, I disregarded it. But after several occasions of DISKCOPY's multiple 'remove source disk, insert target disk' prompts, I figured that for $14.95 plus $3 shipping, it was worth taking a look.

I tried the software on my office machine first and immediately ran into a compatibility problem. So I took the software home and tried it on my generic 386. What I got was one of the slickest little programs I've ever used. It copies disks as fast as you can shuffle them. I was contemplating dragging my disks home from work to copy them, when I noticed the phrase in the installation

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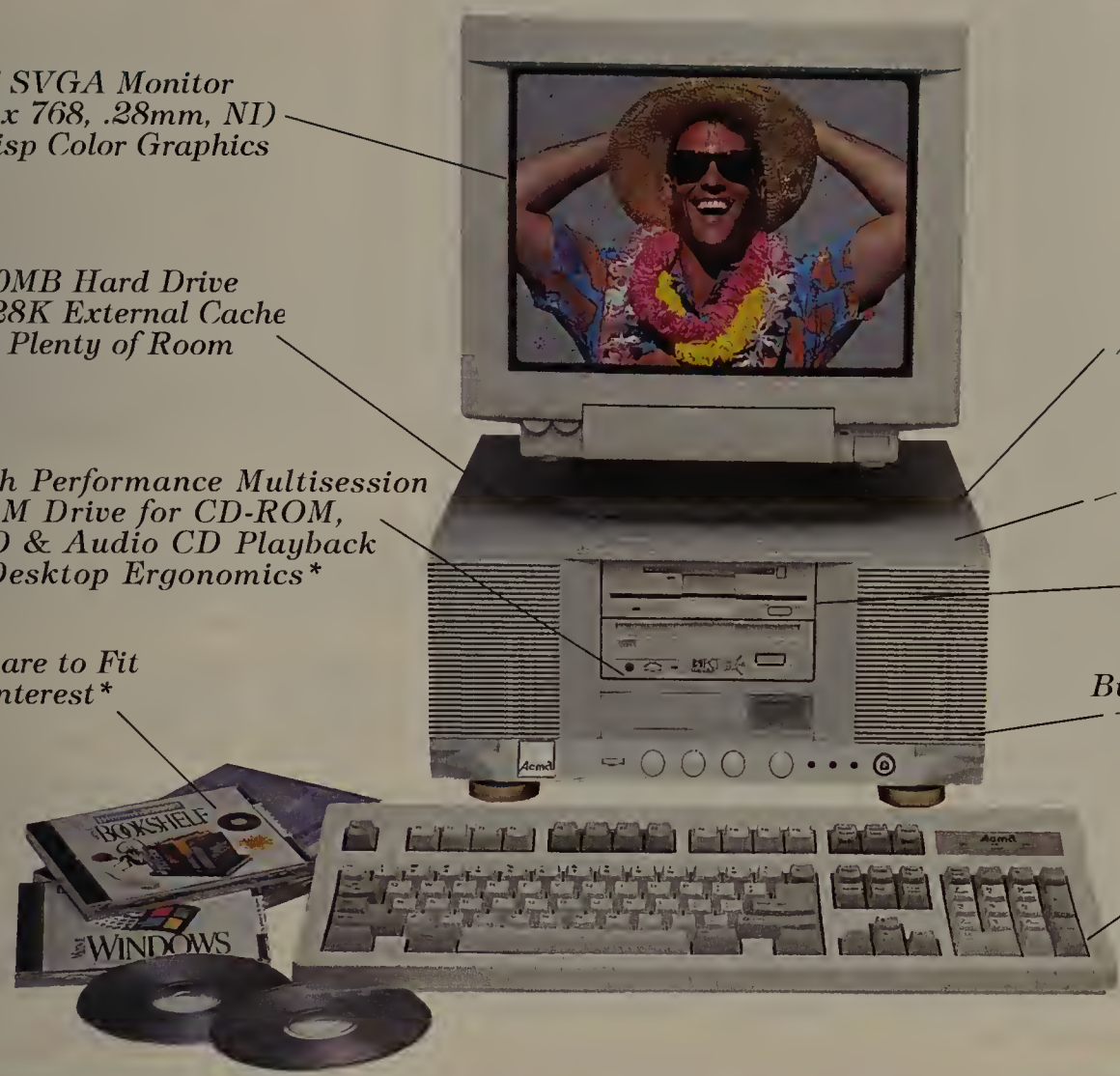

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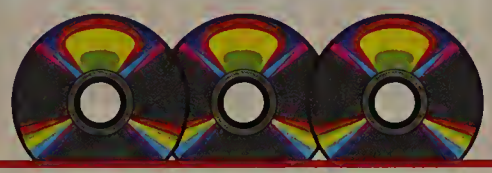

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BUG WATCH

1-2-3 release 4.0 for Windows

Lotus Development has released an update for 1-2-3 release 4.0 for Windows that ensures constant values, carried through a spreadsheet in formulas, remain constant. The update also fixes the problem encountered when printing the close parenthesis and problems with right mouse button support when running OS/2.

Registered users of release 4.0 for Windows will receive a free update automatically in the mail. The update is also available from the company and from the Lotus spreadsheet forum on CompuServe.

Lotus Development Corp.
800/343-5414

Microsoft Flight Simulator 5.0

A few armchair pilots have complained about pauses in Microsoft Flight Simulator that occur as the scenery changes. These delays result from the amount of memory required to load some of the new, improved scenery. If you're experiencing delays longer than 1 second, try using the SmartDrive disk cache included with DOS and Windows. If the delay is less than 1 minute, the problem may be that you don't have enough memory. (Microsoft says Flight Simulator will run slowly on systems with less than 1MB.) The only alternative, aside from upgrading your system, says the company, is to turn off the texturing. Unfortunately, this will take you back to the look of version 4.0 scenery.

Microsoft Product Support
206/637-9308

—Sarah Klein

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with the broadest interest.

Sarah Klein is an editorial intern for PC World.

instructions, "We welcome your comments, either positive or negative..." I gave Kitz Technologies a call and talked to Jeffrey Kitz, the owner. After trying to revise my AUTOEXEC.BAT and my CONFIG.SYS files to resolve the incompatibility—without success—he told me he would work on the problem and have a solution the following week. That was Friday afternoon. First thing Monday, he called to tell me he was sending me revised software that would cure the incompatibility. Sure enough, the program works on my office computer.

I think Jeffrey Kitz went above and beyond the call of duty, and he's got a great product at a more than fair price.

Raymond Paesano,
North Huntington, Pennsylvania

Shop Talk *is researched and written by* PC World *assistant editor Christina Wood. Think you've gotten a raw deal—or a great one?* Consumer Watch *wants to hear the details. We'll investigate complaints and publish letters with the broadest interest. See page 12 for contact information.* ■

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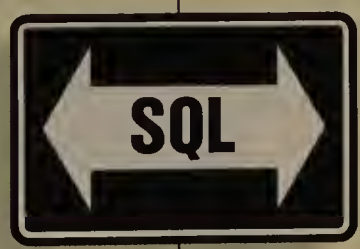

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Of course, no new version of Paradox would be complete without enhancements to the powerful and easy-to-use features that have made it the #1-rated Windows database. Built-in productivity Experts™ guide you at every step, from linking tables to building forms and reports. Object Inspector™ menus provide instant access to capabilities without searching through layers of menus. Paradox's ease of use stays with you as you move up the power curve. Corporate developers find that ObjectPAL,™ the fully integrated programming language, lets you create custom Windows applications that are powerful, graphical, and deliverable *fast*. Plus, 100% compatibility with Paradox DOS means your existing Paradox data will migrate automatically to your new Windows application.

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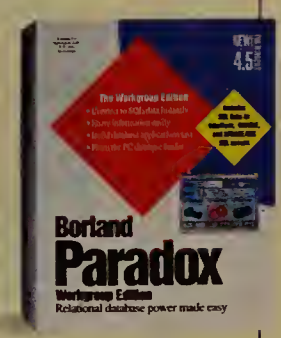

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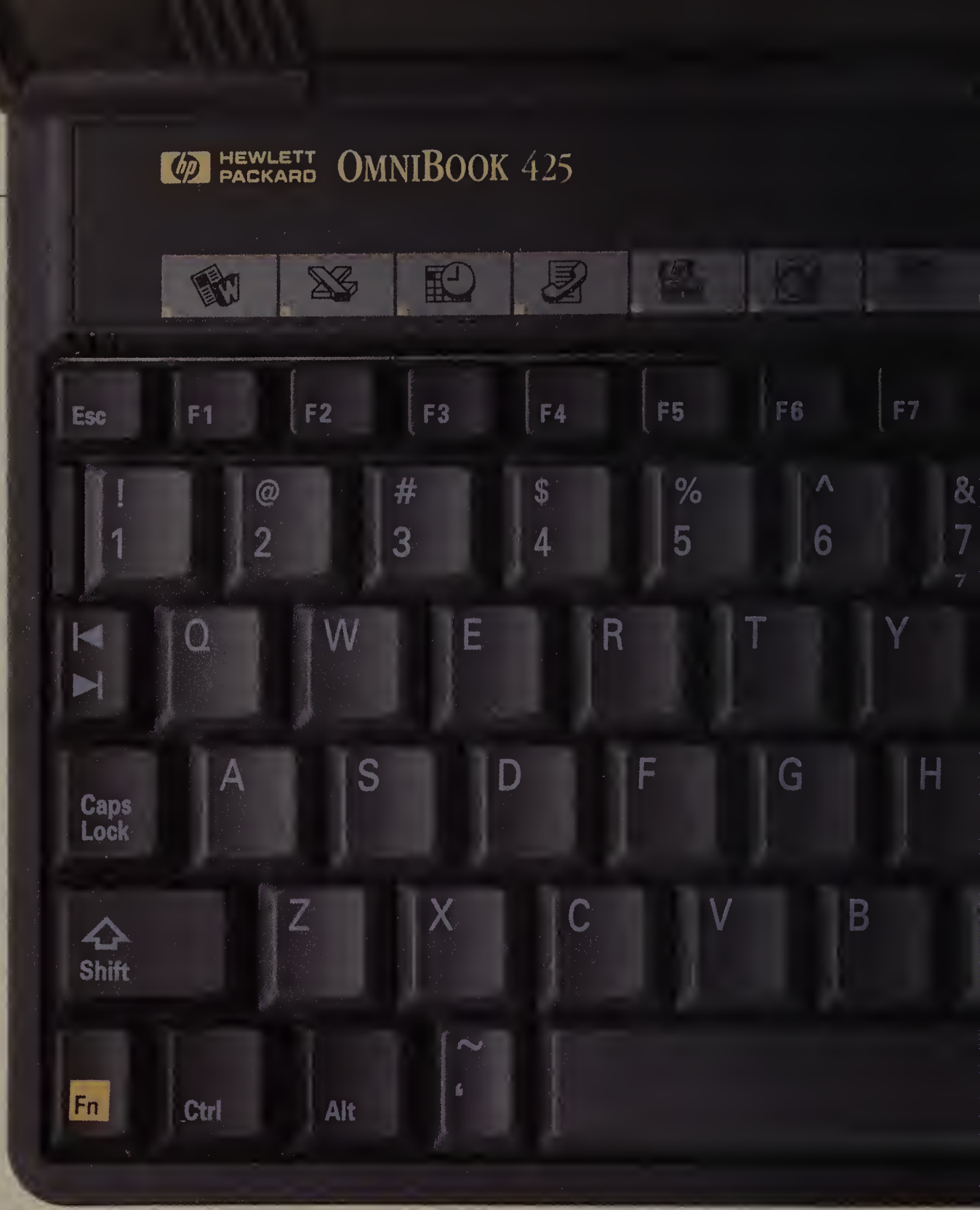

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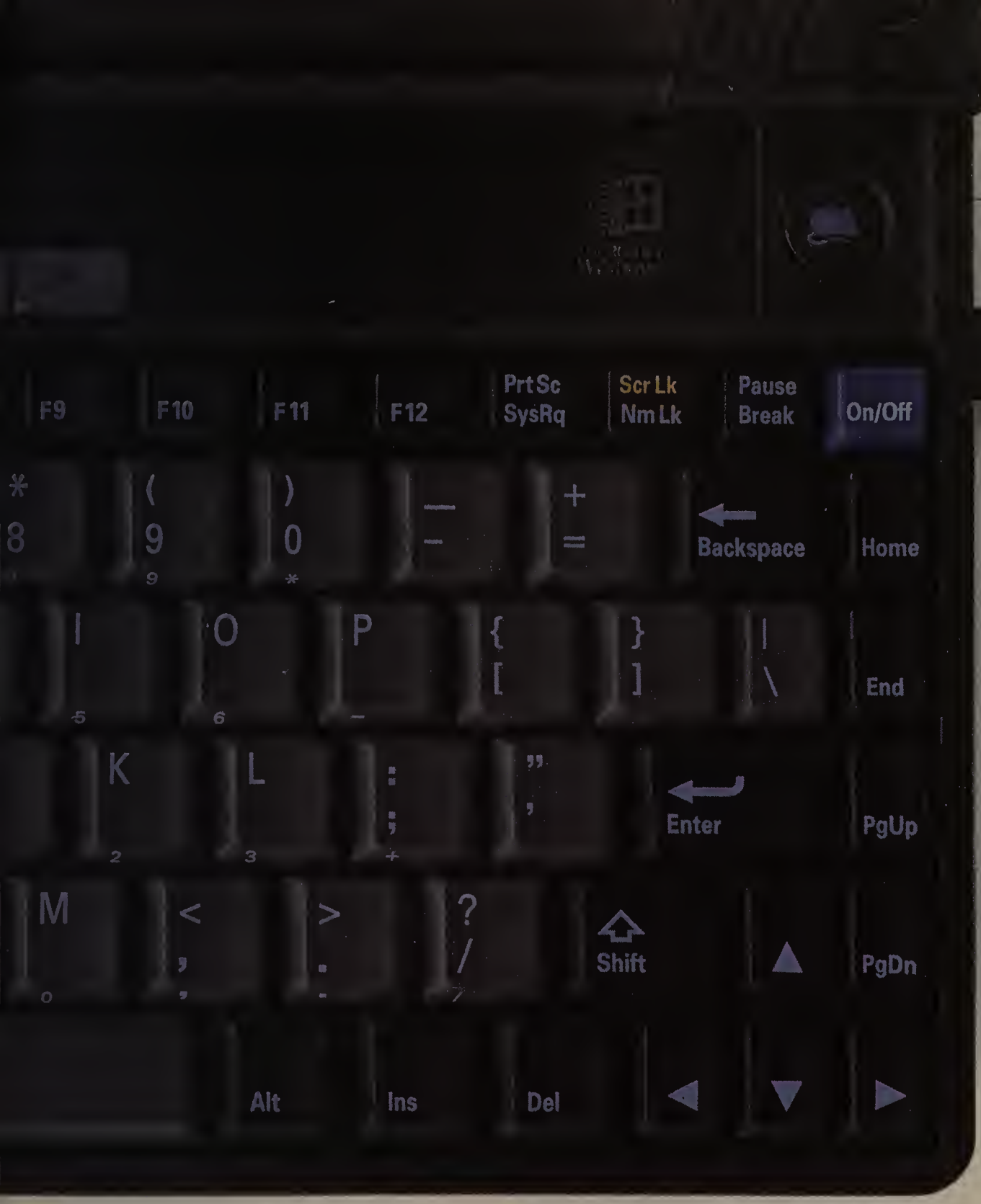

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The Data Access Dance

It's a common paradox: Your business has spent a small fortune on sophisticated technology for storing and retrieving information. But the system is too complicated for people to use, so they revert to looking things up in binders and knocking on doors. This month John Meyer, a departmental administrator for the San Francisco–based law firm Carr, McClellan, Ingersoll, Thompson & Horn, describes how his company found a cost-effective, convenient way to quickly access the information they needed from their corporate database. —*Ed.*

Client, Client, Who's Got the Client?

Ever tried to get information from a corporate database? If you have, you know it's usually more trouble than it's worth. First, you have to persuade the information systems (IS) watchdogs, whose job is to keep corporate information intact and secure, to let go of the data. Then you have to wrestle it into a readable format on your desktop computer.

All of our 120 employees have PCs that are connected to one of four network servers that run DOS versions of WordPerfect, Quattro Pro, dBASE, and Paradox and several custom legal applications. The desktop PCs are also linked to an IBM AS/400 minicomputer that houses all the relevant information about our clients (names and addresses, account status, account manager, and so forth) in two different databases—a customer contact database and an accounting database. Each consists of about 30,000 records.

In spite of this wealth of hardware and software, we had no simple way to perform one of the most common tasks of any business: looking up clients by name. When a client called with a question, we had to make him or her wait—sometimes for hours—while we struggled to find information about the account. First, we had to locate the client's account number on a huge computer printout stored in a three-ring binder. Then we used a terminal emulation program to log on to the AS/400, waited 5 minutes to get into the client database, entered the client number, and waited some more for the correct information to appear on screen. Half the time our PCs froze, since the terminal emulation program took up a huge chunk of their memory. When that happened, we had to reboot and start all over. By the end of the day, the stress level was palpable.

Exasperated users began taking matters into their own hands by typing lists of client information in individual WordPerfect files stored on the servers. As a result, several rogue client lists began to circulate, many introducing misspellings of client names and other errors. In addition, people were spending a lot of valuable time entering and updating data in these incomplete, renegade lists.

In an effort to remedy the situation, the network administrator began saving versions of the corporate database—listing only client name and account number—in read-only text format to the servers. That way, we could at least find the client numbers using WordPerfect's search functions, although it was still time-consuming. We also still had to struggle with the AS/400 system to get more detailed information.

The E-Mail Surprise

This nerve-racking situation went on until 1992, when management decided to purchase an E-mail system.

In searching for an E-mail package, we discovered Futurus Team, a terminate-and-stay-resident (TSR) program that uses only 12.5K of memory. You can activate it with a keystroke, even if another program is also in memory. And—the surprise—Team came with a utility that enabled us to browse dBASE-compatible files without having to load the database program.

John Meyer is a departmental administrator for a San Francisco law firm.

Once we had something our PCs could work with, the IS folks needed to translate the files from the AS/400 database into dBASE format. To do this, they copied the corporate database from the AS/400 to an ASCII-delimited text file. Next, they imported the text file into Paradox, then exported the files from there as dBASE III+ files, which could be read directly by Team. (To ensure that our PC records are up-to-date, IS downloads the database file from the AS/400 into Paradox each night as part of the backup procedure.)

Today our firm keeps a read-only copy of the database where everyone can access it—in the Team directory on

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the servers. When someone signs onto the network, he or she is automatically connected to Team. If the user presses a hot key (<Ctrl>-C, for example, to access the client name) and enters a client's name, Team jumps to the appropriate record in a fraction of the time it took to look up the name in WordPerfect. Not only that, the information is consistent and doesn't spread errors like the rogue lists did.

This system not only gives instant access to the client's account number but lets us locate other useful information, such as account status, date and amount of the client's last payment, and so on. Then we can jump back to the application we were working in by pressing <Esc>. And a bonus we weren't even looking for: All we have to do is hit a function key to export the client's name and address to a document to print letters and addresses from the database. No one's system hangs or crashes while getting into the database. And because the Team index jumps to exactly the right spot in the database, no one wastes time searching for client information.

Although the TSR doesn't let us access the database under Windows, our smattering of Windows users aren't left out in the cold. Asymetrix's ToolBook, which we use to build HyperCard-like applications, has a similar data feature. Using Asymetrix's runtime license, we've been able to distribute the ToolBook application without having to purchase additional copies, and every one of our Windows converts enjoys the same access to the database as the DOS users.

Unfortunately, there's a not-so-happy ending to this story. While the DOS version of Team has been invaluable in solving our problem, Futurus is putting more of its development effort into its Windows version, which is not as much to our liking. So we're looking into other products, such as WordPerfect Office, which includes E-mail and provides access to our database through its built-in Notebook tool. Meanwhile, we intend to hang on to the DOS version of Team, since it gives us just what we want.

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you. See page 12 for contact information.*

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PC MAGAZINE, Portable Computing Issue, August, 1993

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The WinBook was engineered for Micro Electronics, a division of MEI/Micro Center, Inc. MEI is America's leading direct source for computer products. Micro Center has been selling PCs for more than 14 years—longer than IBM or Compaq—with over 736,000 units sold. With over 2.2 million satisfied customers nationwide, we have developed a superior support staff including top engineers and technical specialists. So you always get the highest quality product at the lowest possible price.

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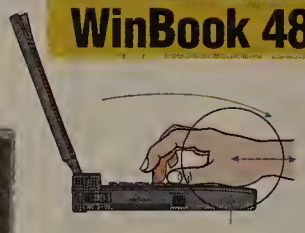

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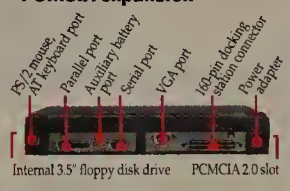
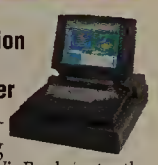
- 512k video RAM.

Mouse/keyboard, parallel, serial & VGA ports plus PCMCIA expansion



Docking station gives you desktop power



With the available docking station, your WinBook instantly becomes a full-function desktop computer. The two expansion slots and drive bays allow you to add peripherals such as monitors, hard drives, CD ROMs, I/O cards or an extended keyboard. It also includes parallel, serial, PS/2 mouse, external keyboard and VGA ports. And it's just $399!

Longer battery life

The WinBook features NiMH 2200 MA batteries with gold-plated contacts. This allows it to run much longer than units with traditional NiCAD batteries—and there's no memory effect.

NEW! Intel486 SX SL Enhanced

intel inside

Monochrome	Dual-Scan Color
$1599	$2399
4MB RAM 200MB HDD	4MB RAM 200MB HDD
• SL Enhanced Intel 486 SX 25MHz	• DOS & Windows • Fax modem included!

Color capable printing from HP and WinBook

HEWLETT PACKARD

$289

The color capable HP DeskJet 310 uses the same inkjet technology as full-size DeskJet models and weighs only 4.3 lbs. Get professional quality 300 dpi output anywhere you need it. Add an optional color kit at a special low price and you have full color printing capabilities!

Your satisfaction is unconditionally guaranteed for 30 days from date of purchase. If for any reason whatsoever you are not satisfied with your purchase from us, we want you to return it. We will be glad to repair the product or give you your money back.

Service, warranty and support

- 72-hour service turnaround guarantee.
- 30-day unconditional money-back guarantee.
- 24-hour burn-in protection.
- One-year limited warranty on parts and labor.
- Toll-free technical support for the life of the computer.

Convenient payment options

Use your MasterCard, VISA, Discover Card, personal check or P.O. with credit approval.

MasterCard VISA DISCOVER

Thank you for your order!

Micro Electronics
a division of MEI/Micro Center, Inc.

Specifications

Size/Weight
- 11" X 8 3/4" X 1 3/4"
- 5.4 lbs. with battery (monochrome)
- 5.9 lbs. with battery (dual-scan color)

Pointing Device
- 16mm Alps dual-action, Microsoft-compatible trackball

Battery
- Up to 3 hours with power management, over 5 hours with auxiliary battery (less 30 minutes for color)
- NiMH (no memory effect)
- 2200 MA with gold-plated contacts
- Worldwide auto-sensing AC adapter
- Quick 1.5-hour recharge

Processor and Memory
- SL enhanced Intel486 SX 25MHz CPU
- 4MB RAM (upgradable to 32MB)
- Pico Power Evergreen HV chipset
- 8k internal cache

Drives
- One built-in 1.44MB 3.5" floppy drive
- Monochrome: Internal 200MB (16ms) hard drive
- Color: Internal 200MB (16ms) hard drive

Software
- Comes loaded with MS-DOS 6.0 and Microsoft Windows 3.1

Display
- Super-twisted 64 gray-scale, 10" LCD and 1024 x 768 for external monitor with 512k video RAM
- Optional dual-scan STN color display
- Adjustable contrast and brightness
- Visible LED indicator on cover-down

Keyboard
- Full-function keyboard with 85 keys and 4 inverted-T cursor control keys, 3.0mm keyboard spacing

Modem
- Fax-9600 baud send/4800 baud receive/2400 baud modem

I/O Ports
- PS/2 mouse interface/AT keyboard interface
- PCMCIA 2.0 slot
- Serial: 9-pin connector
- Parallel port
- Video: 15-pin connector for CRT
- 160-pin docking station
- Auxiliary battery port

Options
- 486 DX 33MHz CPU on selected models
- Docking station

30-day, unconditional money-back guarantee

Call 1-800-468-1037 to order today!

Monday-Friday, 8am-9pm EST • Saturday, 9am-4pm
1160 Steelwood Rd., Columbus, OH 43212 • FAX: 1-800-448-0308

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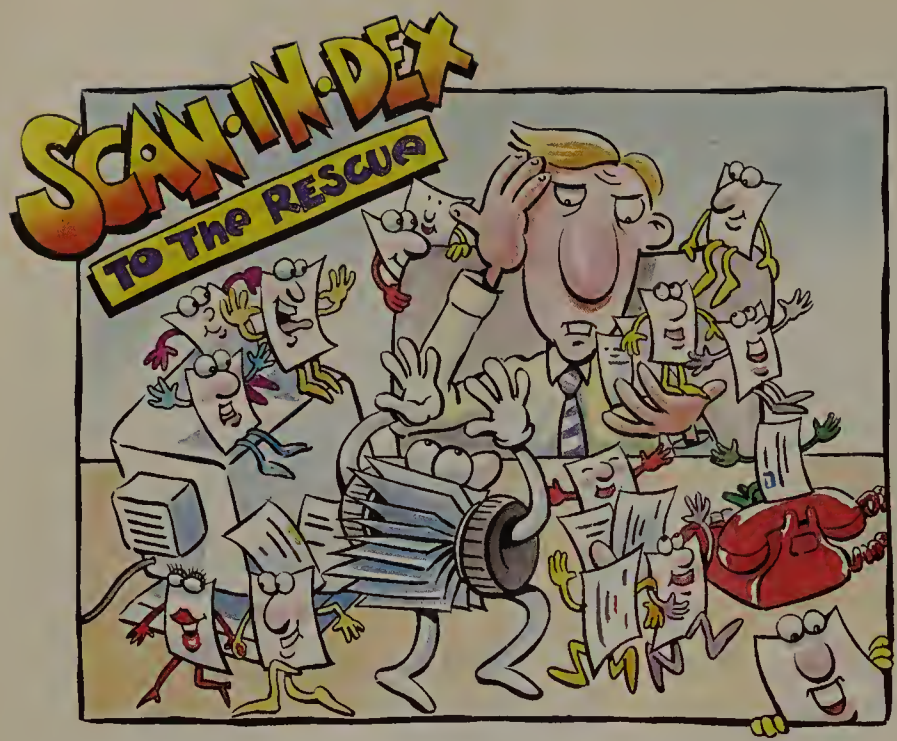
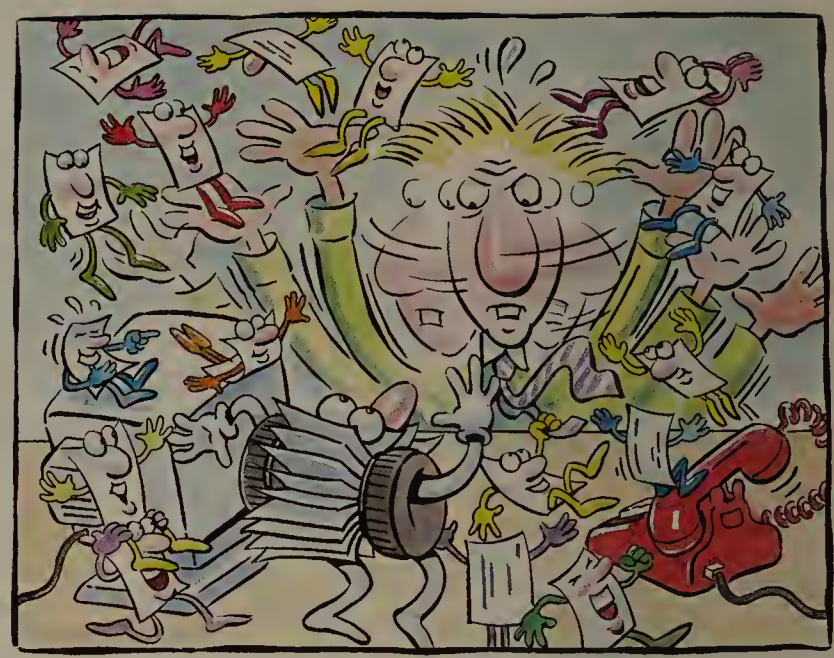
Circle 165 on reader service card

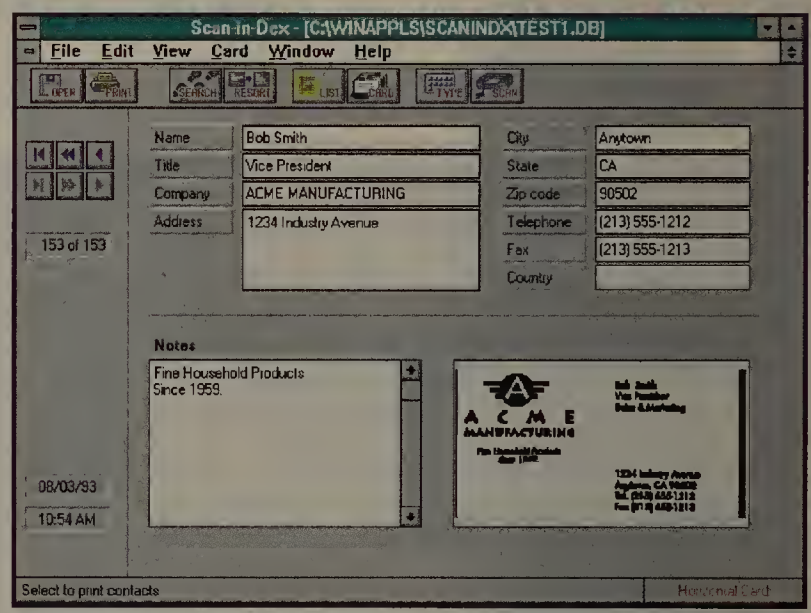


"#@!*#@!, WHAT IS THIS? 'Attack Of The Killer Business Cards'? They're everywhere ... and they're breeding. They multiply faster than my accountant!"



"They're attacking from all sides ...business cards, card files ... t-t-taking over!! ARGH, I'm losing it! Paper shredder ... yeah, that's the ticket, shred 'em, go for the kill. What a nightmare! HELLLLLLLLLP!"

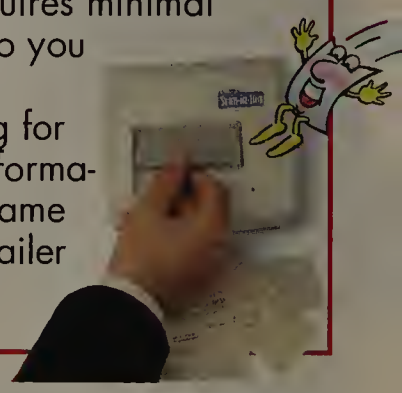
"Yo! Hey genius. Reee-lax. We know what's driving you looney, because it was driving us crazy too. That's why Microtek came up with the ***Scan-in-Dex*** ... Check it out." ☞



"***Scan-in-Dex***, scans, reads and records business card information in an electronic address book in seconds! Then you can print, search, or export the information. So what do you think Bub? Is this a solution to a problem or what?!"

Thanks to ***Scan-in-Dex***, no more business card clutter. Just an automatic, low cost way to organize business card information into your computer. Now Bill has it all together. Cool, calm and in touch, (well, sort of cool??).

Scan-in-Dex solves the business card dilemma by eliminating the need for cumbersome card files. For the first time, accessing business contacts from a computer is a realistic option for busy people, because it requires minimal typing. Scan-in-Dex comes to you from Microtek, the leader in affordable desktop scanning for over a decade. For more information on Scan-in-Dex or the name of your nearest Microtek retailer call, 1-800-654-4160.



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Better Images Through Innovation.

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Circle 195 on reader service card

The PowerPC Walks, Talks, and Acts Like a PC, but Is It a PC?

When is a PC not a PC, even when it's called a PC? The answer: When it's a PowerPC, because the PowerPC chip is most likely to be used not in Windows systems but in Mac and UNIX boxes.

Still, read on: If you're concerned about the power that the Microsoft-Intel combine wields over personal computing, the PowerPC is your best hope of breaking it. And with UNIX becoming increasingly important to many corporate customers, a PowerPC is a logical choice for servers.

Most important: Should you care about a PC chip that really isn't one? If all you're interested in is running Windows on a desktop, probably not. Microsoft has already sent the smoke signals indicating that Windows 4.0 (code-named Chicago) won't run on anything but a system based on an Intel original or compatible chip.

Windows NT, however, could end up running on a PowerPC, and Macintosh and UNIX users are being whipped into a frenzy by the prospect of low-cost power, fed by Motorola's promise that the first chip—the 601—is just the beginning. Future chips, even more powerful, will be designed for portables, high-end desktops, and servers. All, we're told, will be less expensive and more powerful than their "Intel Inside" counterparts.

For Apple and Motorola, the PowerPC replaces the 680-series chips used in the Macintosh since its invention. The goal is to give Apple customers Pentium-grade power plus Mac ease of use for the same or less money than they'd pay for an Intel-based machine.

Although IBM has put the PowerPC to work in UNIX boxes, the company has longer-term plans for the chip as well. It plays a key role in Big Blue's plans for the Workplace OS, the operating system that's supposed to replace OS/2 over the next few years. IBM's Pink operating system (also being co-developed with Apple) is related to Workplace OS and is expected to compete with Microsoft's Cairo, the next version of NT. But Cairo is years away.

So let's return to the spring of 1994. By then, the first PowerPC, the 601, will have appeared in both IBM UNIX systems and high-powered Macs selling for $2500 to $5000.

$2500 PowerPC Systems in 1994

Software performance is the key to the success of both the Pentium and the PowerPC. While they will run today's Windows and Macintosh applications, you won't see the true benefit of their architectures until specially written applications appear. In the case of the PowerPC, it's clear that those applications will arrive. But I still haven't seen any special software releases for the Pentium.

What is clear is that the PowerPC won't be any slower than the Pentium. Also, the first PowerPC-based machines should cost less than comparable Pentiums, and Motorola is signaling analysts that this price advantage will persist. That's probably true—up to the moment Intel decides the PowerPC has taken enough of Intel's share. Even then, Intel will react cautiously, because dropping prices on the Pentium means dropping prices on every other Intel processor.

For that reason, the PowerPC should offer a price/performance advantage. It should also provide a clear path to the object-oriented operating systems that will emerge in the latter half of the decade.

The keys to the success of the PowerPC are only partially in the hands of Motorola, IBM, Apple, or even their customers. The degree to which Microsoft and network giant Novell shun or embrace the chip will be the major factor determining whether a PowerPC ends up on your desktop.

Contributing Editor David Coursey edits P.C. Letter. *He can be reached on PC World Online (see page 12 for contact information).*

LOOKING AHEAD

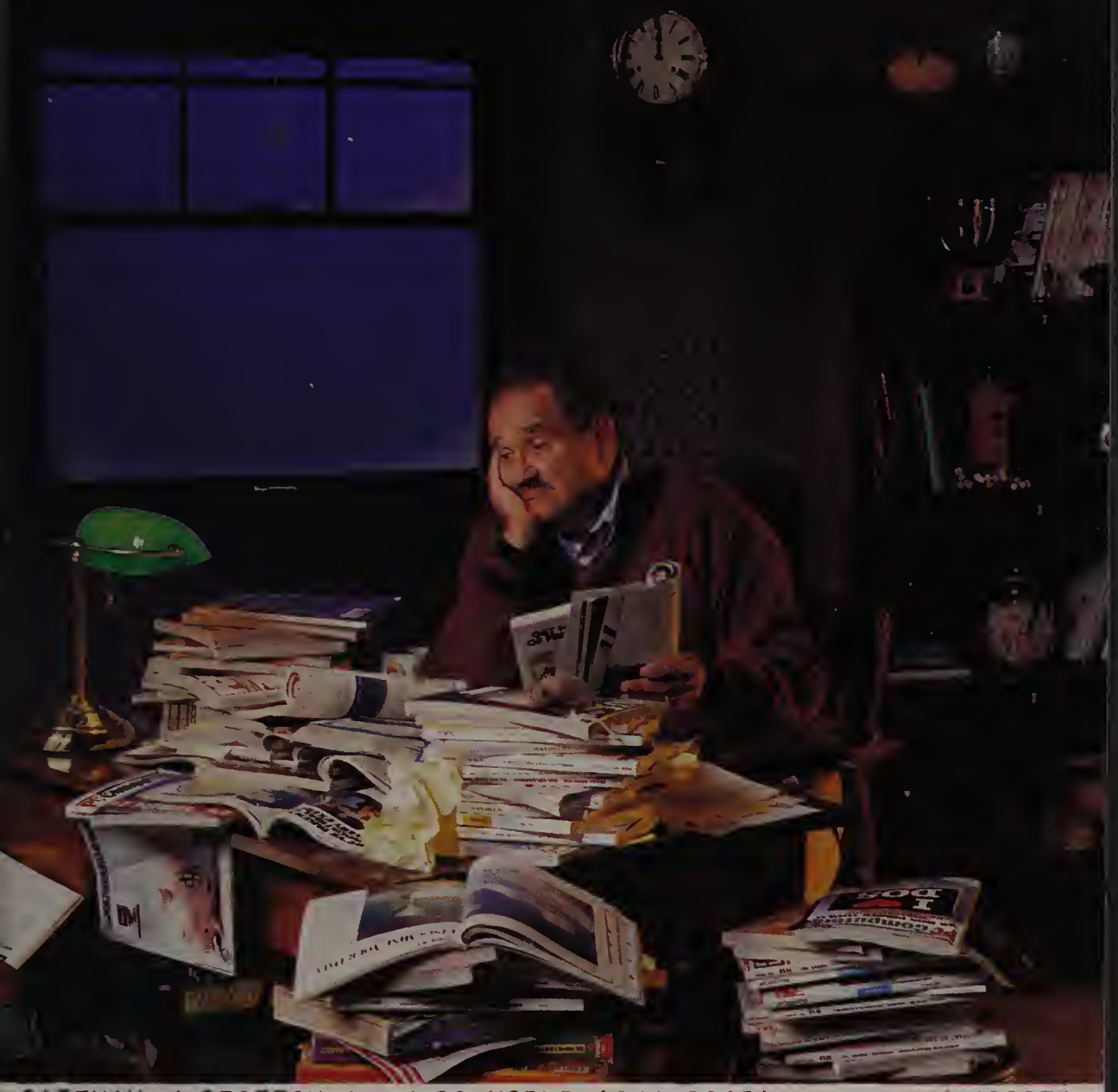
Motorola won't be alone in challenging Intel's dominance in 1994. Intel is making too much money to go unchallenged, even with its deserved reputation for suing first and asking questions later. Look for a Pentium-class CPU next year and remember, Intel avoided using the name 586 because it couldn't protect it with a trademark. If I named the vendor, I'd have to shred you . . . Expect Apple to continue to work very hard at cracking the Windows market by using printers and multimedia as leverage; both are areas where Apple can teach PC vendors a thing or two. However, the company's attempt to merge the Windows and Macintosh interfaces (see Top of the News, page 71) is too underpowered to make Windows users happy . . . Microsoft and Lotus are upset that—imagine this—businesses are buying suites and splitting the applications among several users. Rather than sue over the license violation, the software giants will either cave in or make the packages impossible to separate. Which scenario you think will happen depends on how cynical you are.

By David Coursey

MICHELE CLEMENT

'Twas the night before I bought my PC,

The only thing stirring was one mouse and me.
The PC I planned to purchase with such care,
Was yet unselected, still up in the air.



This business of buying the perfect PC
Was more difficult than I thought it would be.
While visions of failure loomed dark in my head,
My eyelids grew heavy as if they were lead.
I may have been dreaming, but how can I tell?
My memory recorded what happened so well.
Then out on the lawn there arose such a clatter,
I sprang from my desk to see what was the matter.
I saw the strange craft and I let out some "Wows,"
It's not often you see a red sleigh drawn by cows.
For a second I swore that my eyes played a trick,
The driver was Santa Cow, not old St. Nick!
She brought with her toys for broadening minds,
Gateway 2000™ PCs of all kinds.
I remembered that name — "Gateway values," I read,
"Are the best in the industry," editors said.
"Gateway's prices, quality, and service," they wrote,
"Are udderly wonderful. They get our vote."

PC MAGAZINE SERVICE • RELIABILITY • READERS' CHOICE
1992 & 1993

PC WORLD BEST BUY
Best Service 1993

1993 BYTE READERS' CHOICE AWARD
Best Service

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"You've got a friend in the business."®

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MICROSOFT
WINDOWS
Version 3.1
Gateway 2000
HANDBOOK 486

Santa Cow didn't speak, but went straight to her work,
Pulling PCs like magic from her bag with a jerk.
Then, what to my wondering eyes should appear,
But a miniature PC called the HandBook, I hear.
With VGA screen and performance so quick,
I knew at a glance 'twas a 486.
So how could they make a
computer this small?
The whole package weighs less
than three pounds in all!
This little gem would be perfect
for me,
Working hither and yon as I'm oft apt to be.
The HandBook would be a most marvelous gift,
But there are more choices to ponder and sift.

HandBook® 486

- Revolutionary size
- Intel® SL-Enhanced 486 CPU
- Backlit VGA screen
- Great power management
- Touch-type keyboard
- EZ Point™ integrated pointer
- Prices start at just **$1,495!**

intel inside

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MICROSOFT
WINDOWS

At once I set eyes on another delight,
Its screen was a bouquet of colors so bright.
'Twas the 486 ColorBook under the tree,
Same price as mono from another company.
Performance and color at such a good price,
Is there something here that will
barely suffice?
It's light and still small, has a
built-in trackball,
With the ColorBook you really
can have it all!
I started to see that with all
Gateway's wares,
Although it sounds corny, there somebody cares!
You get honest value for your hard-earned buck,
Compared to them I find the other brands ...
Well, they're just not as good.

ColorBook™

- Brilliant color at mono price
- Intel SL-Enhanced 486 CPU
- Great battery life
- Removable hard drive
- Compact size, 5.7 lbs.
- Integrated trackball
- Prices start at only **$1,995!**

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GATEWAY2000
CRYSTALSCAN
GATEWAY2000
GATEWAY2000

Santa Cow was still busy unwrapping PCs,
The next one she opened was sure to appease
A person who's searching for power for less,
Mini desktops from Gateway are simply the best.
These systems' performance is tops in their class,
Just study the benchmarks,
these mini's kick ___.
A whole lotta MIPS here for
not that much money,
This deal would be easy to sell
to my honey.
With local bus also the video
is fleet,
Add software to boot and the system's complete.
When it's said that small packages hold the best things,
It refers to the mini's that Santa Cow brings!

Mini Desktop Systems

- Outstanding price/performance
- Local bus video
- Small footprint case
- Upgradable & expandable
- Large, fast hard drive
- Energy Star "Green" PC
- Prices start at only **$1,275!**

intel inside

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GATEWAY 2000
GATEWAY 2000 4DX2-66V

Behold! What's this? More systems to view?
Santa Cow showed another with a trumpeting moo.
I sneaked a close look out from under a table,
4DX2-66V was the label.
I recognized this "Big Kahuna"
machine,
The one that the editors said
would just scream.
It won all the honors, near
countless awards,
These VESA PCs hold most
proud motherboards.
I ruled out this kind of performance for us,
Too costly, I reasoned, for VESA local bus.
But look at that price, I was certainly wrong,
With Gateway I can have that for which I long.

VESA® Systems

- Exciting video performance
- Non-proprietary VESA local bus
- Compact but roomy desktop case
- Upgradable & expandable
- Large, fast hard drive
- Energy Star "Green" PC
- Prices start at just **$1,495!**

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GATEWAY 2000

"Oh no! Santa's gone!" I heard someone exclaim,
'Twas me, I discovered, no other to blame.
Then I saw where she was, in the kitchen she sat,
Santa Cow having cookies and milk with the cat.
In the doorway I found one
more fabulous thing,
In all of PC-dom, the system
that's king.
A Pentium tower with PCI bus,
This system is certainly worth all
the fuss.
With oodles of RAM and a big
dose of cache,
The P5-60 is the way to be brash.
I've so many choices, now what have I missed?
How 'bout a Gateway for each on my list!

Pentium™ Systems

- Intel's latest 64-bit CPU
- Outstanding video performance
- Extremely fast PCI local bus
- Expandable tower case
- Giant, fast hard drive
- Double-speed CD-ROM
- Prices start at only **$2,995!**

intel inside pentium PROCESSOR

GATEWAY 2000
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Like icing on top of a
wonderful cake,
The Cow filled the stockings with
goodies that make
A PC productive and more
fun to use,
Peripherals keep you from
singing the blues.
The software was Santa Cow's
pièce de résistance,
With titles from Gateway I'd
placate all wants.
Each Gateway PC comes with
software installed,
More options than anywhere
else that I called.

Application Software

Gateway systems now come with Microsoft MS-DOS 6.2 and Windows for Workgroups 3.11. Workgroups does everything Windows 3.1 does, plus it lets you easily set up a network. Another Gateway value for you at no extra charge! If a system configuration includes "choice of application software," choose one of the following packages:

Microsoft®Excel for Windows™
Microsoft Word for Windows™
Microsoft Word and Bookshelf'92,®
CD-ROM Edition
Microsoft PowerPoint for Windows™
Microsoft Project for Windows™
Microsoft Access™ for Windows
The MS Entrepreneur Pack (Works,™ Publisher,™ Money,™ and games)
Borland Paradox® database and Quattro®Pro for Windows spreadsheet

Application Software Upgrades

Upgrade from a choice of application software to Microsoft Office, CD-ROM version, for only **$99!** Ask us about this and other upgrades.

Communications

TelePath™ II Fax/Modem
Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Package includes Crosstalk™ for Windows, WinFax™ Lite, Qmodem and a CompuServe® trial membership. **$159**

Cardinal® 2400 Fax/Modem
Internal fax/modem, 2,400bps modem, V.22bis, with 9,600bps fax capability. Package includes Qmodem and WinFax Lite. **$49**

Intel EtherExpress™
A 16-bit Ethernet adapter from one of the world leaders in network adapters. **$105** Twisted Pair or BNC Kit (BNC Kit includes cable, connector, terminator and card)

Ethernet Adapter from 3Com®
Manufactured by 3Com for Gateway. Features parallel tasking architecture with a high level of integration. **$105** Twisted Pair. **$125** BNC Kit (includes cable, connector, terminator and card)

Colorado Memory Systems TBU
250MB internal automatic tape backup unit copies up to 9.5MB per minute with high-speed data compression. Comes with easy-to-use Windows and DOS software, one tape and cable. **$159**

Monitors

CrystalScan® 17-Inch Monitor
Non-interlaced color monitor, .26mm dot pitch. If your system comes with a 14-inch monitor, you can upgrade to this monitor for **$600**; from a 15-inch monitor, **$520**. (Prices good only for upgrades at the time of system purchase.)

Printers

Panasonic Color-Capable Printer
Add color to your documents with this 24-pin dot matrix printer. Includes Adobe Type Manager.® KX-P2123 Printer **$259**; Color Option **$50**

Epson® Stylus 800 Ink Jet Printer
Great laser quality at an even greater value. Measuring only 17 inches by 10.5 inches, the Stylus 800 has seven different typefaces and prints an extra-quiet 150 characters per second at 360dpi. Parallel cable included. **$289**

Epson ActionLaser 1500 Laser Printer
The ActionLaser delivers professional-quality printouts with crisp, sharp images, black blacks and smooth, "jag-free" lines. It also features a fast six-page per minute print speed, 14 resident fonts, 300 x 300dpi, and 1MB memory expandable to 5MB. Parallel cable included. **$669**

TI MicroLaser™ Pro 600
This Texas Instruments laser printer redefines value in high-performance printing with 6MB RAM standard, a fast eight pages per minute print rate, 500-sheet capacity and true 600dpi quality.

With 23 PostScript® Fonts: **$1,449**

With 65 PostScript Fonts: **$1,629**

The peripherals listed here are sold only with the purchase of a system. For details on our complete line of extras for Gateway customers, ask for our special add-on components division when you call.

GATEWAY2000

"You've got a friend in the business."®

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Of course multimedia is all
the rage,
You've plenty to choose from to
move to that stage.
With sound cards and speakers
and fast CD-ROM,
There's stuff here to please any
Harry, Dick or Tom.

Multimedia

Multimedia Kit

Here's everything you need to add multimedia to your Gateway PC — at a great price!

- Gateway 2000™ 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with game port, stereo mic in, line in/out
- Double-speed CD-ROM drive, tray-loading, compatible with music CDs, multisession photo CDs and CD-ROM titles
- 2 Labtec® speakers
- Microsoft® Encarta Multimedia Encyclopedia
- Gateway System CD with Microsoft Multimedia Pack™

$299

For system configurations that include a CD-ROM drive: **$132**

Altec Lansing Speakers

Get superior stereo sound with these top-rated Altec Lansing ACS-300 speakers with separately powered subwoofer. **$219**

CD Software

Microsoft Encarta For Only $97

Where typical encyclopedias end, Microsoft Encarta begins. It brings learning to life with words, images, animation and sounds. With more than 25,000 articles, 17,000 multimedia elements, eight hours of sound, plus thousands of color photos, video clips, animation and illustrations, Encarta helps you learn about every subject from Aardvark to Zygote. Listen to over 350 music segments, hundreds of bird and animal sounds, over 100 readings by authors, and samples of more than 45 languages. Includes the complete text to the 29-volume 1992 Funk and Wagnall's New Encyclopedia. **$97 SPECIAL!** *Price good only through December 31, 1993.*

MECC Education Pack

MECC, one of the leaders in educational software, has bundled four of its most exciting programs, including: Oregon Trail — an exciting journey through the Old West; Money Works/Clock Works — teaches your child about money and time; Story Book Weaver — allows the child to create storybooks with pictures, words and sounds; and Super Munchers — a computer trivia game for the whole family. **$59**

Just Grandma and Me™

One of the most popular interactive animated stories for children on the market, Just Grandma and Me is packed with multimedia sound effects, music and animation. **$39**

Microsoft Dinosaurs

This program takes you back millions of years for a face-to-face encounter with dinosaurs. It's eye-opening education and awesome entertainment. **$55**

Microsoft BookShelf '93

The powerful interactive reference tool no PC should be without! Includes the Concise Columbia Encyclopedia, the American Heritage Dictionary, Roget's II Electronic Thesaurus, the World Almanac and Book of Facts 1993, Bartlett's Familiar Quotations, the Concise Columbia Dictionary of Quotations, and the Hammond Atlas. **$119**

The 7th Guest

The first interactive drama in a terrifyingly real virtual environment with real actors. The new standard in multimedia entertainment. The game's graphics are so real you'll think you're watching a movie. *(Caution — contains scenes of graphic violence.)* **$49**

Jazz: A Multimedia History

Travel on a musical journey with photos, video clips, sound effects, interviews and jazz music from 1923 to 1991. **$32**

The software listed here is sold only with the purchase of a system. For details on our complete line of extras for Gateway customers, ask for our special add-on components division when you call.

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HANDBOOK® 486

- Weight: 2.94 Lbs.
- Dimensions: 9.75" x 5.9" x 1.6"
- SL Enhanced Intel® 486 Processor
- 4MB RAM (expands to 8MB or 20MB)
- 80 to 130MB IDE Hard Drive
- 7.9" Backlit VGA Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2 Ports
- MS-DOS,® Windows™ & Serial Transfer Cable

HANDBOOK 486SX-25

With 25MHz 486SX CPU and 80MB Hard Drive

$1495

HANDBOOK 486DX2-40

With 40MHz 486DX2 CPU and 130MB Hard Drive

$1995

HANDBOOK PACKS

Traveler's Packs:

- *New!* Microsoft Works for Windows, case, extra battery, alkaline battery pack & PCMCIA 96/24 fax/modem. **$369**
- *New!* Microsoft Works for Windows, case, extra battery, alkaline battery pack & PCMCIA TelePath™ fax/modem. **$489**

Presenter's Pack:

- PCMCIA VGA adapter, Asymetrix® Compel & case. **$319**

COLORBOOK™

- Weight: Under 5.7 Lbs.
- Dimensions: 11.7" x 8.5" x 1.77"
- SL Enhanced Intel® 486 Processor
- 4MB RAM (expands to 8, 12 or 20MB)
- 3.5" 1.44MB Diskette Drive
- Removable 80 to 260MB IDE Drive
- 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial & PS/2® Ports
- External VGA Port
- MS Works for Windows™
- MS-DOS and Windows

COLORBOOK 486SX-25

With 25MHz 486SX CPU and 80MB Hard Drive

$1995

COLORBOOK 486SX-33

With 33MHz 486SX CPU and 170MB Hard Drive

$2395

COLORBOOK 486DX-33

With 33MHz 486DX CPU and 260MB Hard Drive

$2795

COLORBOOK PACKS

Traveler's Packs:

- Case, extra battery & PCMCIA 96/24 fax/modem. **$329**
- Case, extra battery & PCMCIA TelePath fax/modem. **$449**

NOMAD 450DXC

- Weight: 6.2 Lbs.
- Dimensions: 8.5" x 11" x 2.2"
- 50MHz Intel 486DX2 Processor
- 8MB RAM
- 3.5" 1.44MB Diskette Drive
- 200MB IDE Hard Drive
- 8.4" **Color Active Matrix Screen**
- NiMH Battery & AC Pack
- Simultaneous Video with IMB
- 79-Key Keyboard
- Microsoft® Ballpoint Mouse
- 9600/2400 Fax/Modem
- 1 Parallel, 1 Serial Port
- MS-DOS, Windows & Works for Windows™

$3995

OPTIONS

PCMCIA Cards:

- TelePath fax/modem — 14,400bps send-receive fax, 14,400bps modem. **$319**
- Fax/modem — 9,600bps send-receive fax with 2,400bps modem. **$199**
- Ethernet adapter. **$189**
- Token Ring adapter. **Call**
- HandBook VGA adapter. **$229**

Batteries:

- 2.2Ah NiMH batteries. **$89** each
- HandBook alkaline battery pack. **$29**

Diskette Drive:

- HandBook 3.5" 1.44MB external diskette drive. **$99**

Cases:

- Soft-sided black carrying cases custom-designed for ColorBook or HandBook. ColorBook **$49** HandBook **$55**

Extended VIP Warranty:

- We'll ship a replacement notebook within 24 hours during one-year warranty. Must be purchased at point of sale. Call for details. **$100**

4MB or 16MB RAM Upgrades:

- Due to the volatility of the DRAM market, please call for pricing.

Easy Payment Options

We make it easy for you to buy a Gateway PC, too! We accept most major credits cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers.

You can also apply for our new Gateway 2000™ DuoLine™ MasterCard® Card, issued by Dial National Bank, which lets you make purchases from Gateway and anywhere else MasterCard is accepted by giving you two lines of credit — one for Gateway purchases and one for all other purchases. For Gateway purchases, the card has no annual fee and a low variable interest rate of just 12.9% APR. For other transactions, you get a variable interest rate of 13.9% APR and a low $18 annual fee.*

The Gateway interest rate translates into some low monthly payments for your PC. For example, payments on a purchase of $2,000 would be $60 per month for 42 months.** Ask your sales representative about the DuoLine MasterCard, or call 800-846-1781 for an application.

*Cash advance fee is $1 plus 2% of the amount of the cash advance, but not less than $5 nor more than $10. Financing is available on approved credit with the Gateway DuoLine MasterCard, issued by Dial National Bank, Des Moines, Iowa. **The final payment may be less. The total of all payments is $2,489.40 which includes $489.40 in finance charges. The example given above assumes you have no other balance on your Gateway line of credit and that the APR does not change. This information does not apply to the MasterCard line of credit, which has different terms.

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4SX-33

- Intel® 33MHz 486SX Processor
- 4MB RAM
- 3.5" Diskette Drive
- 212MB 13ms IDE Hard Drive
- Intel Pentium™ Technology Ready
- Local Bus Graphics Accelerator w/ 512KB DRAM
- 14" Color CrystalScan® 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard
- Microsoft® Mouse
- MS-DOS®6.2, Windows for Workgroups™ 3.11 & Tools on Top
- MS Works for Windows™
- EPA Energy Star Compliant

$1295 *4SX-25* **$1275**

4DX-33

- Intel 33MHz 486DX Processor
- 4MB RAM
- 3.5" Diskette Drive
- 212MB 13ms IDE Hard Drive
- Intel Pentium Technology Ready
- Local Bus Graphics Accelerator w/ 512KB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- MS Works for Windows
- EPA Energy Star Compliant

$1495

MINI UPGRADE

At the time of purchase, you can upgrade your 4SX-25, 4SX-33 or 4DX-33 mini desktop system to include the following features:

- 128KB Cache
- 1MB Video DRAM
- 424MB 13ms IDE Hard Drive
- 124-Key AnyKey Keyboard
- Choice of Application Software

$225 *(A $275 value!)*

Sorry, offer good only at the time of system purchase.

4DX2-50

- Intel 50MHz 486DX2 Processor
- 4MB RAM, 128KB Cache
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Intel Pentium Technology Ready
- Local Bus Graphics Accelerator w/ 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey®Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1795

HOME OFFICE PACK

Include these peripherals with your new Gateway desktop and you have everything you need for an efficient home office.

- Epson® Stylus 800 Ink Jet Printer
- TelePath™ II Fax/Modem
- 1 Parallel Cable

$429

Only with system purchase.

TOOLS ON TOP FROM CENTRAL POINT

Tools on Top™ is now included on all Gateway 2000 mini desktop, desktop and tower systems. Program includes file manager, desktop and emergency disk portions of Central Point's award-winning PC Tools for Windows.

VESA SYSTEMS

4SX-33V

- Intel 33MHz 486SX Processor
- 4MB RAM
- 5.25" & 3.5" Combo Drive
- 212MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB™ Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 5 ISA & 2 VESA®/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1495

4DX-33V

- Intel 33MHz 486DX Processor
- 8MB RAM, 128KB Cache
- 5.25" & 3.5" Combo Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1995

4DX2-50V

- Intel 50MHz 486DX2 Processor
- 8MB RAM, 128KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 2MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2295

66MHz BEST BUY

- Intel 66MHz 486DX2 Processor
- 8MB RAM, 128KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 1MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2495

4DX2-66V

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 2MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2995

4DX2-66E

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- 5.25" & 3.5" Combo Drive
- 500MB 11ms SCSI Hard Drive
- 32-Bit EISA SCSI Controller
- VLB Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Tower Case with 300-Watt Power Supply
- 6 EISA & 2 VESA/EISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3495

Energy EPA POLLUTION PREVENTER

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PENTIUM SYSTEMS

P5-60 BEST BUY

- Intel 60MHz Pentium™ Processor
- 8MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics Accelerator with 2MB DRAM
- 14" Color CrystalScan® 1024NI
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey® Keyboard
- Microsoft® Mouse
- MS-DOS®6.2, Windows for Workgroups™ 3.11 & Tools on Top
- Choice of Application Software

$2995

P5-60

- Intel 60MHz Pentium Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 528MB 12ms IDE Hard Drive
- PCI Local Bus Graphics Accelerator with 2MB DRAM
- 17" Color CrystalScan 1776LE
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3995

PCI 486 SYSTEM

P4D-66

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Diamond Viper Graphics Accelerator with 2MB VRAM
- 15" Color CrystalScan 1572FS
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3295

ULTIMATE UPGRADE

For the ultimate in performance, upgrade any 16MB desktop configuration to:

- 32MB RAM
- Diamond Viper Graphics Accelerator with 2MB VRAM

$999

Sorry, offer good only as an upgrade at the time of system purchase.

MULTIMEDIA KIT

Here's everything you need to add multimedia to any Gateway desktop PC. You won't find a better holiday price anywhere!

- Gateway 2000 16-Bit Sound Card, Sound Blaster-™Compatible
- Double-Speed CD-ROM
- 2 Labtec® Speakers
- Microsoft Encarta Encyclopedia
- Gateway System CD

$299

For system configurations that include a CD-ROM drive: **$132**
Only with system purchase.

SERVICE

Every Gateway 2000™ system is backed by:

- 30-Day Money-Back Guarantee
- One-Year Limited Warranty
- Lifetime Toll-Free Technical Support
- On-Site Service Available To Most Locations
- Lifetime BBS Membership
- FaxBack Automated Fax Service

Our money-back guarantee does not include shipping. On-site service is provided at no charge if our technicians determine it is necessary during the warranty period. If you would like to read the details of our warranty, guarantee and on-site service program, please call for a free copy.

Gateway 2000 is a corporate sponsor of

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SOFTWARE

If a system comes with "choice of application software," choose one of the following packages:

- Microsoft Excel for Windows™
- Microsoft Word for Windows™
- Microsoft Word and Bookshelf '92,® CD-ROM Edition
- Microsoft PowerPoint for Windows™
- Microsoft Project for Windows™
- The MS Entrepreneur Pack (Works,™ Publisher,™ Money,™ and games)
- Borland Paradox® database and Quattro® Pro for Windows spreadsheet
- Microsoft Access™ for Windows

With selected desktop systems you also get the following software and extras at no additional charge:

- *New* Microsoft MS-DOS 6.2
- *New* Microsoft Windows for Workgroups 3.11
- *New* Triton CoSession Host Remote Diagnostics (with all fax/modems)
- Central Point Tools on Top
- *New* Kiplinger's CA-Simply Money
- QAPlus Diagnostics
- Gateway System CD with Microsoft Multimedia Pack (with CDs only)
- Multimedia On-Line User's Guide (with CDs only)
- Gateway Mall On-Line Catalog (with CDs only)
- Gateway 2000 Computer Glossary

Her work all but finished,
the night nearly through.
The Cow looked right at
me and gave me a moo!
She spoke not in words,
but I read in her voice
The message that
Gateway's the logical
choice.

GATEWAY2000

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800-846-2065

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Fax 605-232-2023 • FaxBack 605-232-2561
Add-On Sales 800-846-2080
Toll free from Canada and Puerto Rico 800-846-3609
Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays(CST)

I woke with a start! Was I dreaming it all?
No matter, I mused, for sure Gateway I'll call.
Then I heard her exclaim as she drove out of sight.

"Happy holidays to all,
and to all a good night!"

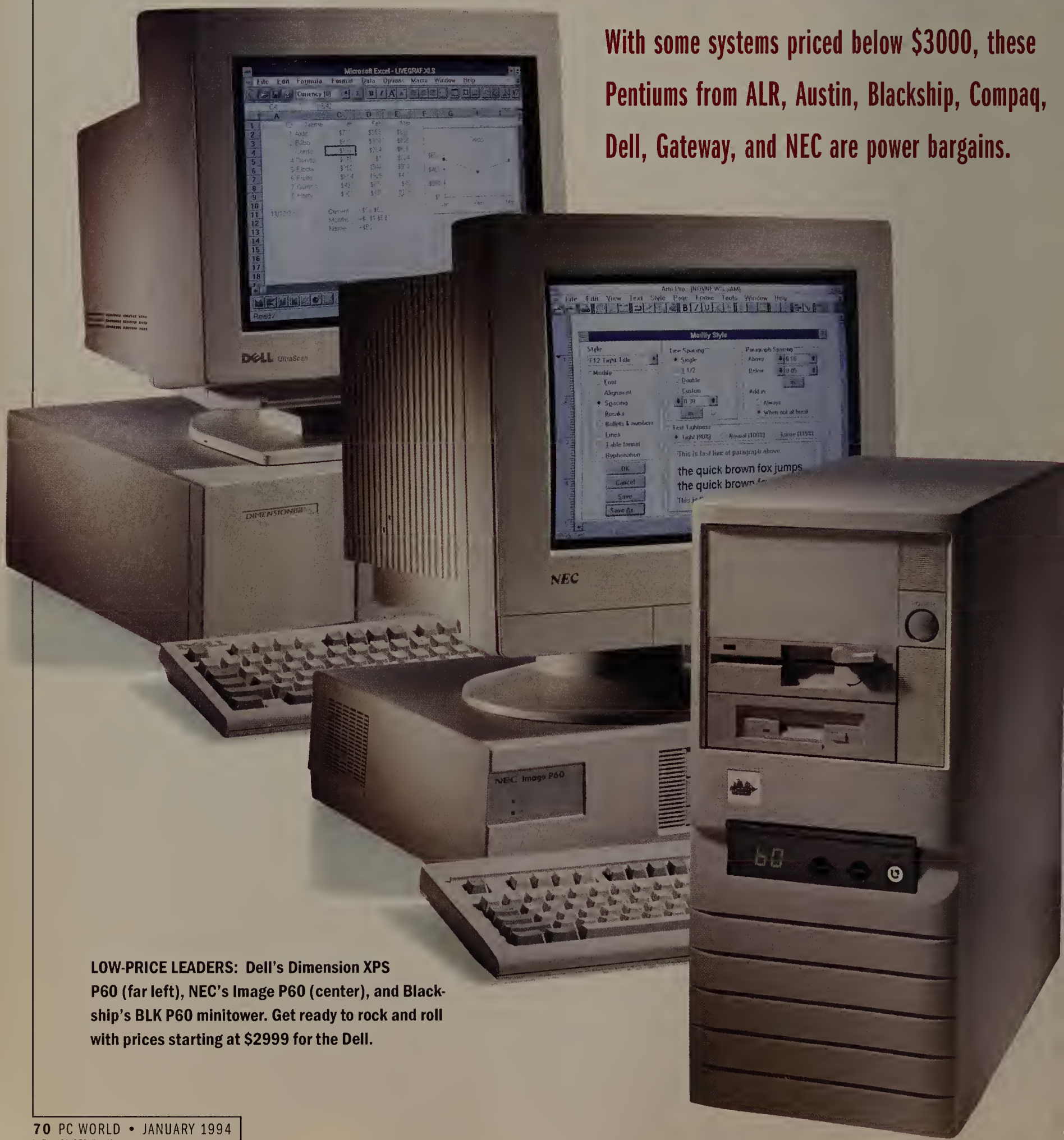
GATEWAY2000

800-846-2065

610 Gateway Drive • P.O.Box 2000 • North Sioux City, SD 57049-2000

7 PENTIUMS FOR LESS

With some systems priced below $3000, these Pentiums from ALR, Austin, Blackship, Compaq, Dell, Gateway, and NEC are power bargains.



LOW-PRICE LEADERS: Dell's Dimension XPS P60 (far left), NEC's Image P60 (center), and Blackship's BLK P60 minitower. Get ready to rock and roll with prices starting at $2999 for the Dell.

Edited by Russell Glitman

THAN $3500

TEST DRIVE

Everybody wants a computer that rocks, but rock videos on the desktop are not a good enough reason to buy a new Pentium machine. That's what I keep telling myself as my eyes wander from the new video-enhanced Dell Dimension XPS P60 to my checkbook. As I fire up Pink Floyd's *Money* video once more, the dance revue fills the 17-inch screen and my conviction wavers.

One thing is certain, though: Pentium is arriving on the desktop with a vengeance. Fully configured Pentium machines start at $2995. Many of the systems include Intel's PCI (Peripheral Component Interconnect) local bus, which often runs faster than the VESA local bus, allows you to connect more peripherals, and offers the promise of Plug and Play card installation. However, the PC World Test Center found that at least one Pentium system with a VL bus, Advanced Logic Research's Evolution V/60, outperformed some Pentium-PCI systems. This could be due to a combination of the still-evolving PCI technology and the ALR design, which includes a write-back cache and a 64-bit bus between memory, cache, and the CPU.

Pentium systems are arriving on the desktop with a vengeance—fully configured machines start as low as $2995.

Dell Dimension XPS P60

Dell's Pentium multimedia system is one of the most engaging PCs to hit my desktop. Armed with the hottest hardware and loaded with powerful software, the Dimension XPS P60 marks a return to the style that put this irreverent Texas company on the map.

Based on a 60-MHz Pentium, the XPS uses PCI. The base Dimension XPS system, selling for $2999, features 8MB of RAM that can be expanded to 128MB, a 256K secondary cache, a 3½-inch floppy drive, a 450MB IDE hard drive, a 1MB #9 GXE PCI video card, a Panasonic 563 double-speed CD ROM drive, a 14-inch super-VGA color monitor, and a mouse.

What really makes the XPS sing is its optional Sigma Designs ReelMagic full-motion video card, which plays MPEG (Motion Picture Experts Group) audiovisual files. These are theater-quality, full-screen, full-motion images. Our preproduction system included the ReelMagic board, but the super-VGA drivers weren't ready, and our benchmarks produced anomalous results with the standard 1MB PCI video card that came with the system.

Compaq Deskpro XE 560

You didn't expect to see Compaq in a story about low-cost, high-end computers? Shame on you. That doesn't mean that the Houston juggernaut is crowding the $2999 price point seen elsewhere: The XE has an estimated street price of just under $3500—without a monitor. The Compaq may still represent the best value, though, because it's arguably the best-designed system.

Compaq's unique TriFlex/PC architecture uses a 128-bit channel between memory and the secondary cache, so that while the Pentium is digesting one chunk of data, the next chunk is on its way. This architecture produces optimal performance. Case in point: the XE 560 was the best performer in our Freelance for Windows and Paradox for

News Monitor

WINDOWS ON THE MAC: Apple is developing a hybrid PC-Macintosh desktop system that will run both Windows and Mac software. Dubbed the Quadra 610, DOS Compatible, it includes an Intel 486SX 25-MHz processor and a Motorola 68040 25-MHz CPU.

The 486SX will be on a daughtercard with its own VGA video, so you'll be able to run Mac and Windows apps concurrently. Hot keys will let you toggle between DOS/Windows and Macintosh apps and cut and paste text and graphics between environments. The system, based on Apple's Quadra 610, should be available in the first half of 1994, according to Apple spokesperson Renee Austin. No price has been set. MS-DOS 6.2 will be included, but not Windows. One drawback for corporate buyers: No LAN support is planned for the DOS environment.

PLUG 'N' PLAY UPDATE: Expect to see Plug and Play PCs in early 1994. That's the word from the top hardware and software companies, which recently released the final Plug and Play BIOS specification. Designed to make PCs easier to configure and use, the spec will allow automatic installation and configuration of peripherals, such as memory cards, modems, and sound cards—no need to fiddle with jumpers, DIP switches, or DMA and IRQ settings. Compaq and Phoenix Technologies codeveloped the Plug and Play BIOS, available free of charge. Windows 4.0, due to ship at the end of '94, will support the Plug and Play spec.

(continued on page 73)

PHOTOS: JOHN GREENLEIGH; ILLUSTRATION: JEFF KOEGEL

High-Speed, Low-Price Pentium PCs

	Excel for Windows 4.0	Freelance for Windows 1.0	Paradox for DOS 3.5	Word for Windows 2.0
ALR Evolution V/60	62	90	77	81
Austin Premier P5-60 System	74	90	121	84
Blackship BLK P60	70	97	108	95
Compaq Deskpro XE 560	69	82	70	81
Gateway 2000 P5-60	67	89	109	83
NEC Image P60	74	89	97	85

Time in seconds; lower number is better. *Source: PC World Test Center*

Continued from page 71

DOS tests, and it tied for first place with the ALR Evolution V/60 system in our Word for Windows test.

The XE includes 8MB of video RAM expandable to 136MB, a 256K secondary cache, a Compaq QVision local bus graphics adapter with 1MB of RAM expandable to 2MB, one floppy drive, Enhanced Business Audio with Sound Blaster compatibility, and a 270MB hard drive. MS-DOS 6.0, Windows 3.1, the Microsoft Windows Sound System, and Compaq's TabWorks Windows front end are also part of the package.

Gateway 2000 P5-60

Despite the crowd of well-known companies trying to encroach on its high-end mail-order business, Gateway 2000 is holding its position on the cutting edge with a line of snappy Pentium systems priced from $2995 to $3995. The basic model includes 8MB of RAM expandable to 128MB, a 256K secondary cache, one floppy drive, a dual-speed CD ROM drive, a 424MB IDE hard drive, a PCI local bus ATI Ultra XLR graphics accelerator with 2MB of RAM, a super-VGA monitor, a programmable Any-Key keyboard, MS-DOS, Windows 3.1, a Microsoft mouse, Central Point's Tools on Top, QA Plus diagnostics software, and Microsoft Works for Windows 2.0. This well-priced system is a sturdy contender, coming in second in the Excel test, tying for second in the Freelance test, and scoring third in the WinWord event.

NEC Image P60

NEC's Image P60 system relies on its Diamond Viper, PCI local bus Windows accelerator with 2MB of video RAM and support for 16-bit and true-color 24-bit graphics. At $3499 with no monitor, the P60 has a 250MB IDE hard drive, one floppy drive, a 256K secondary cache, and 8MB of RAM expandable to 192MB. MS-DOS 6.0 and Windows 3.1 come with the system. The preproduction NEC was a middle-of-the-road performer, tying for second in Freelance and scoring third in Paradox.

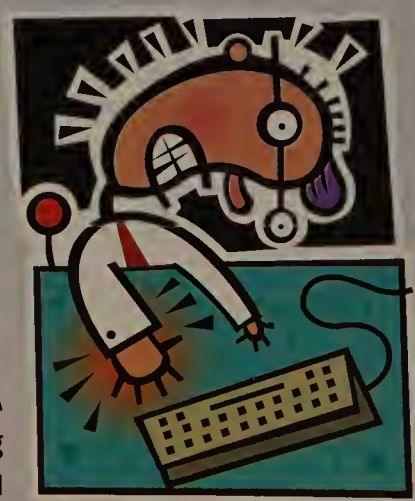
ALR Evolution V/60

Although Advanced Logic Research advertises this system as a "$2500 Pentium," it costs more than the better-equipped Dell when you add such essentials as a hard drive and monitor to its base price. With 8MB of RAM (expandable to 128MB), a 420MB IDE hard drive, and a Western Digital Paradise video card with 1MB—but without a monitor—the Evolution V/60 should sell for about $3500 on the street. With the 14-inch, noninterlaced, multiscan super-VGA monitor, its list price will be $3926. DOS 6.2 and Windows 3.1 are bundled. The system has one floppy drive and a 256K secondary cache. The snappy VL-bus system won top honors in the Excel for Windows 4.0 test. That record was marred by its performance on the Freelance for Windows test: It tied for next to last.

Ergonomic Regulations:

The Occupational Safety and Health Administration (OSHA) has turned its attention to the fast-growing problem of repetitive strain injury; ensuing regulations could affect PC users and their employers. If existing laws are any indication, regulations that mandate how PC workstations are set up could cost employers up to $1000 per employee for new equipment. The flip side would be good news for PC users: Ergonomically correct workstations might prevent career-ending repetitive strain injuries (RSIs) such as carpal tunnel syndrome.

OSHA is analyzing data from a recently completed survey of 9000 U.S. companies, and proposed regulations could be issued in 1994, according to OSHA spokesperson Akio Konoshima. However, enacting those regulations will be a long, complicated process, and it is unlikely they will become law before 1996.



These regulations would be the first aimed at preventing RSIs in the workplace. An existing law, the Americans With Disabilities Act, covers people already afflicted with RSIs. This law requires companies to make "reasonable accommodations" for such employees or face prosecution and payment of compensatory damages. Since the ADA's inception, almost 12,000 cases have been filed. Most are settled out of court, with companies agreeing to make workstation changes based on recommendations from the employee's doctor. Ergonomic adjustments can cost as little as $150 for swivel arm supports and as much as $1000 for arm supports plus an ergonomically correct keyboard and chair. If OSHA regulations specify workstation equipment, costs could be similar.

Seven Pentiums for $3500 or Less

Pentium power at what used to be 486 prices.

ALR Evolution V/60

Estimated Street Price:
Without monitor, $3500
Advanced Logic Research, 800/444-4257
Reader service no. 714

Austin Premier P5-60

Pricing: $2999
Austin Computer, 800/752-1577
Reader service no. 715

Blackship BLK P60

Pricing: $3395
Blackship Computer Systems, 800/531-7447
Reader service no. 716

Compaq Deskpro XE 560

Estimated Street Price:
Without monitor, $3479
Compaq Computer, 800/345-1518
Reader service no. 717

Dell Dimension XPS P60

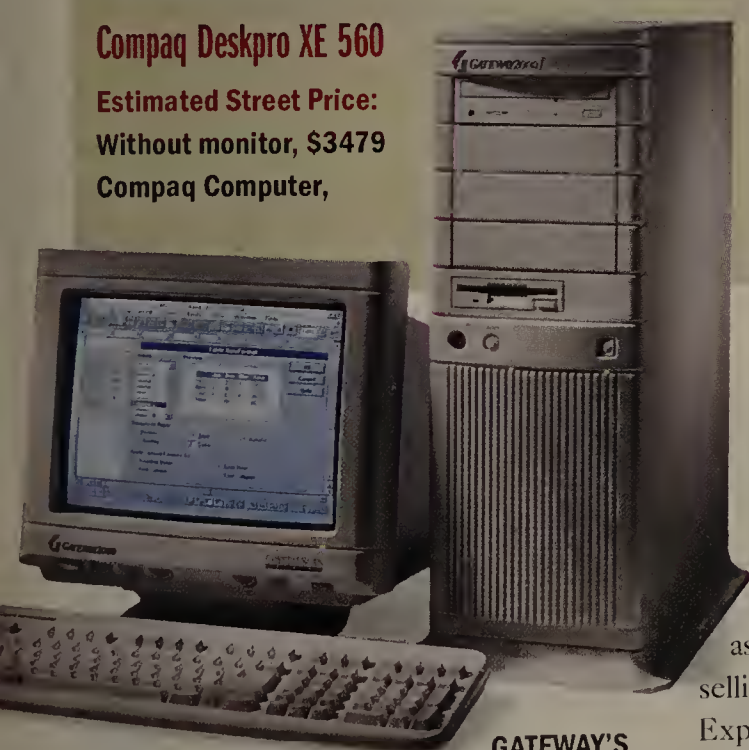
Pricing: $2999
Dell Computer, 800/289-3355
Reader service no. 718

Gateway 2000 P5-60

Pricing: $2995
Gateway 2000, 800/846-2065
Reader service no. 719

NEC Image P60

Estimated Street Price:
$3499 without monitor
NEC, 800/632-4636
Reader service no. 720



GATEWAY'S $2995 P5-60 comes with a CD ROM drive.

Blackship BLK P60

The Blackship BLK P60, which has 16MB of RAM and a roomy 512K secondary cache, seems outfitted for success. For $3395 you get two floppy drives, a 340MB IDE hard drive, a caching disk drive controller with 1MB of RAM on board, a VESA local bus Orchid Fahrenheit graphics card with 1MB of RAM, a Microsoft mouse, a 14-inch flat-square super-VGA monitor, DOS 6.0, Windows 3.1, and a minitower case. Too bad the Blackship didn't perform better—it came in last in our Freelance and Word for Windows tests.

Austin Premier P5-60 System

With tight engineering, rock-bottom prices, and environmentally correct corporate policies, Austin Computer Systems is becoming one of our favorite vendors. Its Premier P5-60 System is a solid value, with 8MB of RAM expandable to 128MB, a 256K secondary cache, one floppy drive, a Sony 31A/02 CD ROM drive, and a 14-inch monitor, all for $2999. You also get a choice of one Lotus application.

The P5-60's performance was a bit of a disappointment; it tied for last in our Excel test and was last in the Paradox test.

Decisions, Decisions

Do you need a Pentium? Maybe not. They run only about 30 percent faster than 486DX2-66s, although bigger performance gains will be realized when applications optimized for Pentium arrive. Unless you do CAD, crunch big spreadsheets, run graphics-intensive software, or just want the biggest, toughest machine on the block, the best thing to do may be to ask these companies how much they're selling 486DX2-66s for these days.

Expect to see full reviews of these systems in future issues of *PC World*. But if you decide to make the jump to a Pentium now, the race is on, and there are clear frontrunners. For business use, there's no better Pentium package around than the Compaq Deskpro XE 560. For the small office or home office, the ALR Evolution is a close second in performance, but for personal use, nothing will rock your desktop like the Dell Dimension XPS P60 with Sigma Designs' ReelMagic card. *Money, it's a hit.*

—Joe Abernathy

News Monitor

(continued from page 71)

HIGH PERFORMANCE IDE: A new Enhanced IDE spec will offer many SCSI features, drive makers say. Enhanced IDE will boost data transfer rates to between 11MB and 13MB per second over a local bus (up from standard IDE's 2MB to 3MB per second on the ISA bus) and will remove the 528MB limit on drive capacity. Enhanced IDE will support multiple IDE devices and other peripherals such as CD ROM drives. Western Digital is already shipping an Enhanced IDE drive.

BULLETPROOF WINDOWS FOR $49: IBM claims its latest OS/2 release, OS/2 for Windows, installs a complete 32-bit version of OS/2 2.1 on your system without disturbing the existing configuration. This can mean fewer crashes and improved multitasking. This program lets Windows 3.1 users run, with minimal modification, Windows applications they've already installed by clicking familiar icons from within OS/2. Through February 17, the 11-disk product will sell for $49; then the price will jump to $149.

NEW NEC NOTEBOOKS: NEC's Versa E (Enhanced) Series notebooks, priced at $2899 to $6029, should be available by the time you read this. The systems use an SL Enhanced 40-MHz or 50-MHz 486DX2 processor and boast brighter displays, with 9.5-inch STN sidelit monochrome or active-matrix color screens. The notes measure 11.7 by 9.3 by 2.1 inches. The monochrome

(continued on page 75)

PHOTO: JOHN GREENLEIGH; ILLUSTRATION: JEFF KOEGEL

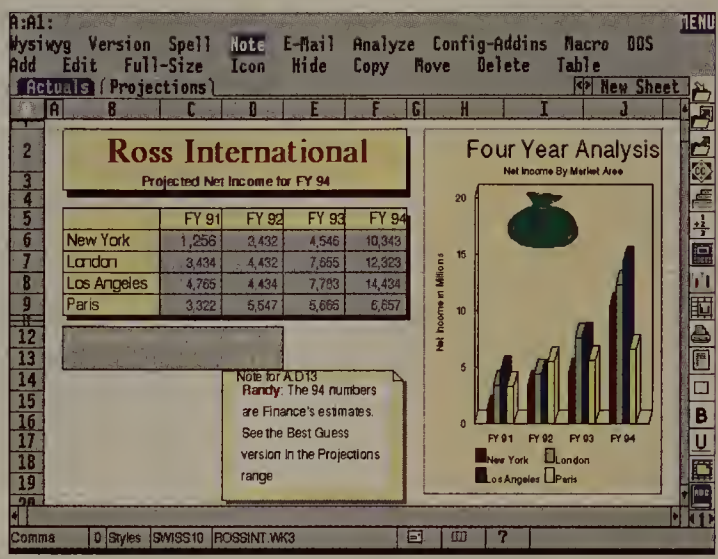
A Bit of Windows in 1-2-3 Release 4

TEST DRIVE

Fledgling spreadsheet users have never had it easy. Early DOS products had a steep learning curve and left many novices confounded and unproductive. Though Windows versions made these products easier to use, they have never run well on the anemic 286- and 386-based systems that companies typically pass down to their less experienced staff.

Lotus's 1-2-3 release 4 for DOS addresses these issues. Lotus has added numerous Windows-like features, such as scroll bars and dialog boxes, that facilitate on-screen navigation and provide easier access to powerful features. The program, like its release 3.4 predecessor, can run on a 286 PC with 1.5MB of RAM and requires up to 8MB of hard disk space, depending on the installation options you choose.

For power users and others who don't have the hardware or inclination to use a Windows spreadsheet, this new DOS product offers a sampling of goodies introduced in 1-2-3 for Windows release 4, such as E-mail support and version management.



TRACK DIFFERENT VALUES FOR RANGES and create long version names with the Version Manager, an abridged version of the feature offered in the Windows product.

In addition, the product retains almost complete compatibility with earlier versions, so macros and DOS spreadsheet applications should run without a hitch. (The Windows version introduced changes to the menu structure; consequently, some macros won't run without modification.) Finally, the customizable interface lets you turn off the graphical interface features and invoke the character-based interface.

If the improvements geared toward advanced users sound a little sparse—they are. These users may be better off bypassing this product and moving to a Windows spreadsheet.

Graphical Interface-lift

Release 4 borrowed some features from the Windows version that make locating commands easier. In the pre-beta version we saw, the vendor replaced many of the product's crude lists of menu options, called setting sheets, with interactive, informative dialog boxes that save keystrokes and avoid confusion. A live status bar at the bottom of the screen, common to Lotus Windows products, offers a miniature menu of options for changing the numeric format, font, or other style features of a current range selection. The addition of scroll bars also makes on-screen navigation easier.

Lotus also made logical changes to the

DOS Obituary Premature, Users Say:

The reports of the DOS spreadsheet's death have been greatly exaggerated. Take the 1300 spreadsheet users for whom Dianne Lemon provides support at BellSouth Telecommunications in Birmingham, Alabama. Lemon, an assistant staff manager in computer support, estimates that about half these employees use the DOS version of 1-2-3. "They say [the DOS version] is fine—it's working," she explains. "They don't want to learn Windows."

For other BellSouth users, Windows applications aren't really an option. The company has migrated many of its 286-based systems to users who were previously stuck with dumb terminals. However, because of a freeze on PC purchases, these 286 systems haven't been upgraded to run Windows applications efficiently.

If Lemon has any say in it, however, one upgrade many of her users will make is to Lotus 1-2-3 release 4 for DOS. She likes the Windows-like interface for two reasons: First, it ensures company-wide consistency by providing Windows spreadsheet users with a familiar interface. Second, it may ease the transition of DOS users to Windows.

She also likes the cell annotation feature, which will make it easier for her users to explain how they arrived at certain calculations in the pricing spreadsheets they create for new products and services. In addition, because these spreadsheets are often group projects, she thinks her users will find the product's cc:Mail support a real time-saver.

Lemon isn't alone. Though Windows spreadsheet products have been gaining steadily in popularity, the demand for DOS versions will not disappear anytime soon, according to analyst Mary Conti Loffredo of International Data Corporation, a market research company based in Framingham, Massachusetts. Many users are content with their 286 and 386 systems and don't want to incur the expense and trouble of upgrading to Windows, she says.

MIKE CLEMMER

menu structure. In particular, the prerelease version we saw showed a new Tools menu that consolidates features that were previously buried in the program or activated by arcane keyboard commands. For example, the add-ins option under the Config menu item replaces the <Alt>-<F10> command to let you specify auto-loading add-ins. The System command, which takes you to DOS, was moved from the main menu to Tools. The Macro command enables you to run macros from the menu bar instead of by pressing <Alt>-<F3>.

The worksheet tabs make managing 3-D spreadsheet files easier. As in the Windows product, the tabs can be named and appear at the top of the page. Each tab represents a different worksheet in a 3-D file. To display a sheet, click on its tab. If you want to load more than one 3-D file, the program assigns matching colors to all sheets from the same file, eliminating confusion.

DOS Spreadsheets Slip Under Windows

Spreadsheet units shipped (in millions)

	1991	1992	1993[1]	1994[2]	1995[2]
DOS 4.4[3]	2.9	1.6	1.0		.5
Windows	2.2	3.9	6.8	7.7	8.0

[1]Estimated [2]Projected

[3]The main competitors in the DOS spreadsheet market are Lotus's 1-2-3.2x and 3.x products and Borland's Quattro Pro products. Lotus 1-2-3 currently has 69 percent of the DOS spreadsheet market.

Source: International Data Group

1-2-3 release 4 for DOS

Numerous features borrowed from the Windows version give this DOS champion another round in the ring.

Key Features: Improved interface • Windows-like dialog boxes, status bar, scroll bars • 3-D Worksheet Tabs • Version Manager • E-mail support • Spelling checker • Cell annotation

Estimated Street Price: $350, $100 for upgrade

Availability: First quarter 1994

Lotus Development,
800/343-5414

Reader service no. 721

More Power to You

Lotus added a cell annotation feature for attaching an explanatory note to any cell in a worksheet. Another handy addition is a spelling checker with more than 200,000 words, which can share its dictionary with the Windows version should you decide to upgrade later. A Worksheet Column Fit-Widest command eliminates annoying asterisks when a number is too long for its column. Lotus also plans to add a backup feature that automatically saves files at timed intervals. E-mail support lets you send files via cc:Mail for DOS without exiting the spreadsheet, a time-saver if you use this mail program.

Lotus also included a scaled-down Version Manager, introduced in the latest Windows release, which lets you create versions of a range and group them into what-if scenarios. This feature is adequate for an individual user, but it lacks key work-group features found in the Windows product. For example, you can't easily maintain an audit trail, tracking information such as author, date of entry, and special comments. (The Windows product dedicates sortable fields for version information and can automatically pull details, such as the date of creation or modification and the author's ID, from a user's PC. The DOS product has a single 32-character version-name field—a user can include descriptive information but it must be done manually and it can't be separated into sortable fields.) Also, the DOS product doesn't offer the merge feature for consolidating scenarios from different users.

The DOS version lacks numerous other features of its more powerful Windows counterpart. For accessing data in external databases, you're still stuck with the clumsy DataLens technology, which was replaced in the Windows product. You're also missing the 90-plus new @functions, in-cell editing, and some intelligent charting capabilities.

Still, if you need a DOS spreadsheet for a novice user, a Windows-phobe, or anyone with a usable but underpowered PC, this product remains one of the best in its class.

—Randy Ross

News Monitor

(continued from page 73)

version weighs 6.2 pounds; the color model, 6.9 pounds. NEC claims to have boosted local bus video performance by 20 percent, and battery life is 5 to 7 hours on the monochrome and 3 to 5 hours on the color. The removable 1.44MB floppy drive lets you slide in an optional second battery, doubling the time between charges, according to NEC. The new Versas have a lighter AC power supply and an embedded trackball, located below the <Space> bar. Hard drives come in 120MB or 250MB sizes, and 4MB of RAM (upgradable to 20MB) is standard.

SIMON SAYS PHONE HOME: BellSouth and IBM will offer a personal communicator built around a cellular phone. The 8-by-2.5-by-1.5-inch device has a backlit LCD screen, 1MB of PS RAM, 1MB of RAM, a PCMCIA Type II slot, and a battery pack good for 8 hours of standby use or 1 hour of live use on the phone. It weighs 18 ounces. With a PCMCIA paging card, you can receive alphanumeric pages even when the device is off. A wireless modem sends and receives E-mail (via Lotus cc:Mail) or faxes. You can write faxes on screen with an "inking" technology. The DOS-based Simon is due in the first quarter of 1994 at an undetermined price.

Edited by Randy Ross

Contributors: Joe Abernathy, Jeff Bertolucci, Russell Glitman, Anita Hamilton, Laurianne McLaughlin, and Randy Ross

JEFF RUEGEL

Under $1000 for 600-dpi PostScript Printer

TEST DRIVE

Sharp's JX-9460PS, the first 600-dpi printer with PostScript for less than $1000, redefines what you can afford in a personal printer.

Whether you're in a home office, a small office, or a corporate office, you'll appreciate the 6-ppm speed and PostScript Level 1 capability, which lets you quickly create documents with high-quality graphics, charts, and scanned images. We were pleased with the printer's performance and the output quality of newsletter pages created in Ventura Publisher. To attain an estimated street price of $999, Sharp had to make a few compromises. But overall the JX-9460PS makes an ideal choice for desktop publishers on tight budgets.

To beat the price of the chief competition, Hewlett-Packard's $1729 LaserJet 4MP (which offers a 4-ppm engine, 600-dpi resolution, and PostScript Level 2), Sharp is shipping the JX-9460PS with only 2MB of memory. This lower memory requirement is possible thanks to a new memory-saving technology from Phoenix Technologies called SoftBand. The technology sends bands of data to the print engine instead of sending a page's worth, as other PostScript printers do. This reduces the required memory for a 600-dpi PostScript printer from the typical 6MB used in the HP printer.

Beside price and output quality, footprint size—a compact 13 by 14.4 inches—may be this printer's next best feature. It's slightly taller than the 14.7-by-15.4-inch 4MP but takes up a little less space on your desk. The JX-9460PS also offers 35 PostScript fonts and 13 outline fonts for PCL 5 mode. The printer has parallel ports and offers optional serial ports, and both can be active at the same time. An AppleTalk interface is optional. The printer uses a 16-MHz AMD RISC processor.

The Sharp does have one big drawback for anyone who plans to print full-page scanned photographs. With 2MB and SoftBand, it does a good job with typical newsletter-size scanned images, but it can't print a full-page image without an additional 4MB of RAM. Sharp charges $457 list for a proprietary 4MB memory card—a hidden cost that hikes the printer's price to around $1400.

Compared to the HP LaserJet 4MP, the Sharp printer has a few other limitations you should consider. In PCL mode, the Sharp can print only at 300-dpi resolution. If you want automatic emulation switching, which lets the printer automatically adjust for documents whether they're composed for PostScript or PCL 5, you'll need an extra 1MB ($141 list).

In addition, the printer doesn't meet Energy Star compliance, though it does provide a sleep mode. It comes with a 250-sheet tray; an additional tray isn't available. Since the JX-9460PS is targeted as a personal device, its speed and paper capacity make it a poor choice for a LAN.

Still, after you weigh the pros and cons, the Sharp is a powerful personal printer at a reasonable price. Sharp has put PostScript and professional-looking documents within reach of a wider market. And there's more good news ahead. Sharp's new printer may be only the tip of the iceberg: Analysts say competition in the low-cost 600-dpi marketplace will really heat up in 1994. Users can expect more products and even lower prices. In fact, Sharp has announced that the JX9660-PS, an 8-ppm version of this printer, will ship in late November 1993 (with two 250-sheet paper trays and an AppleTalk interface). Consumers will have to watch this market carefully to get the best deals.

—Laurianne McLaughlin

Sharp JX-9460PS

The first 600-dpi printer with PostScript for under $1000, ideal for graphics jobs such as newsletters and handouts.

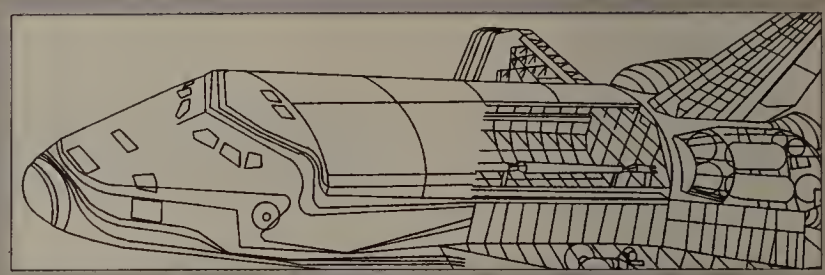
Key Features: 600-dpi resolution • 6-ppm speed • Small footprint

Pricing: $1199 list, $999 street

Availability: Immediate

Sharp Electronics, 201/529-9593

Reader service no. 703



all the great features that have made tura the standard for publishing the ld over—plus it's packed with scores

Ventura

600 DPI FOR YOUR DESKTOP: The JX-9460PS prints almost photo-quality images. It's perfect for projects like newsletters.

PRINTING POSTSCRIPT FOR LESS: Sharp's JX-9460PS.

JOHN GREENLEIGH

YOU KNOW HOW SOME THINGS ALWAYS LOOK GOOD FROM A DISTANCE?

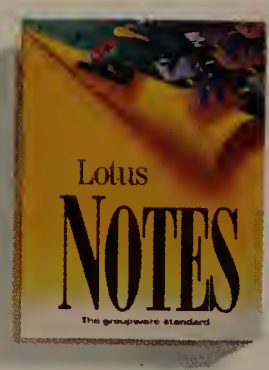
As anyone who's ever been in the desert can tell you, things aren't always as they appear. Whether it's an oasis in the sand. Or a suite of application software in the office.

Unless you look very closely, for example, you'd swear Microsoft® Office was a revolutionary new way to use, manipulate and share business data through integrated software. When, in reality, Lotus® SmartSuite® achieved that distinction over a year ago.

A closer inspection will also demonstrate that not all of Microsoft Office's five applications are designed for general business users. And some new versions aren't yet available at all. Lotus SmartSuite, on the other hand, has five of the leading, award-winning, most usable applications. All of which truly complete the desktop of every Windows™ user.

LOTUS SMARTSUITE 2.1 VS.	MICROSOFT OFFICE PRO
APPLICATIONS	
1-2-3® RELEASE 4 AMI PRO® 3.01 FREELANCE GRAPHICS® 2.01 APPROACH® 2.1 ORGANIZER™ 2.1	EXCEL 5.0 WHEN AVAILABLE WORD 6.0 POWERPOINT® 4.0 WHEN AVAILABLE ACCESS™ COUPON FOR 1 SEAT OF MICROSOFT MAIL
INTEGRATION	
LOTUS APPLICATION MANAGER COLLECT & COPY DDE, OLE CONSISTENT USER INTERFACE	MICROSOFT OFFICE MANAGER DDE, OLE (2.0 IN WORD) SEMI-CONSISTENT USER INTERFACE
WORKGROUP	
ALL APPS MAIL-ENABLED VERSION MANAGER™ INTEGRATED WITH NOTES® THRU NOTES/FX™	ALL APPS MAIL-ENABLED SCENARIO MANAGER
VALUE	
$299 COMPETITIVE UPGRADE	$348 COMPETITIVE UPGRADE

And while Microsoft claims Office is going to fully maximize cross-product integration and consistency, Lotus is already way down the road to achieving precisely that across all five applications. Sharing the same user interface. With common menus. And SmartIcons.® To say nothing of task-oriented functions that cross applications. Collect and Copy for instance. With a single click, it lets users gather data from 1-2-3® and Freelance Graphics® and combine it into an Ami Pro® word processing document.



SmartSuite and Lotus Notes. The secret to integrating workgroups instead of just applications.

Of course, you might be just as easily deluded

MAYBE YOU'D BET
LOOK AT MICROSOF

*In Canada call **1-800-GO-LOTUS** **$299 direct from Lotus. Offer expires 1/31/94. Qualifying competitive products are Microsoft Excel, Borland,* Quattro* Pro (not including SE), Microsoft Word, WordPerfect,* Wordsta
Symphony,* Ami Pro, Freelance Graphics, Approach and Graphwriter.* ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, SmartSuite, SmartIcons, Ami Pro, 1-2
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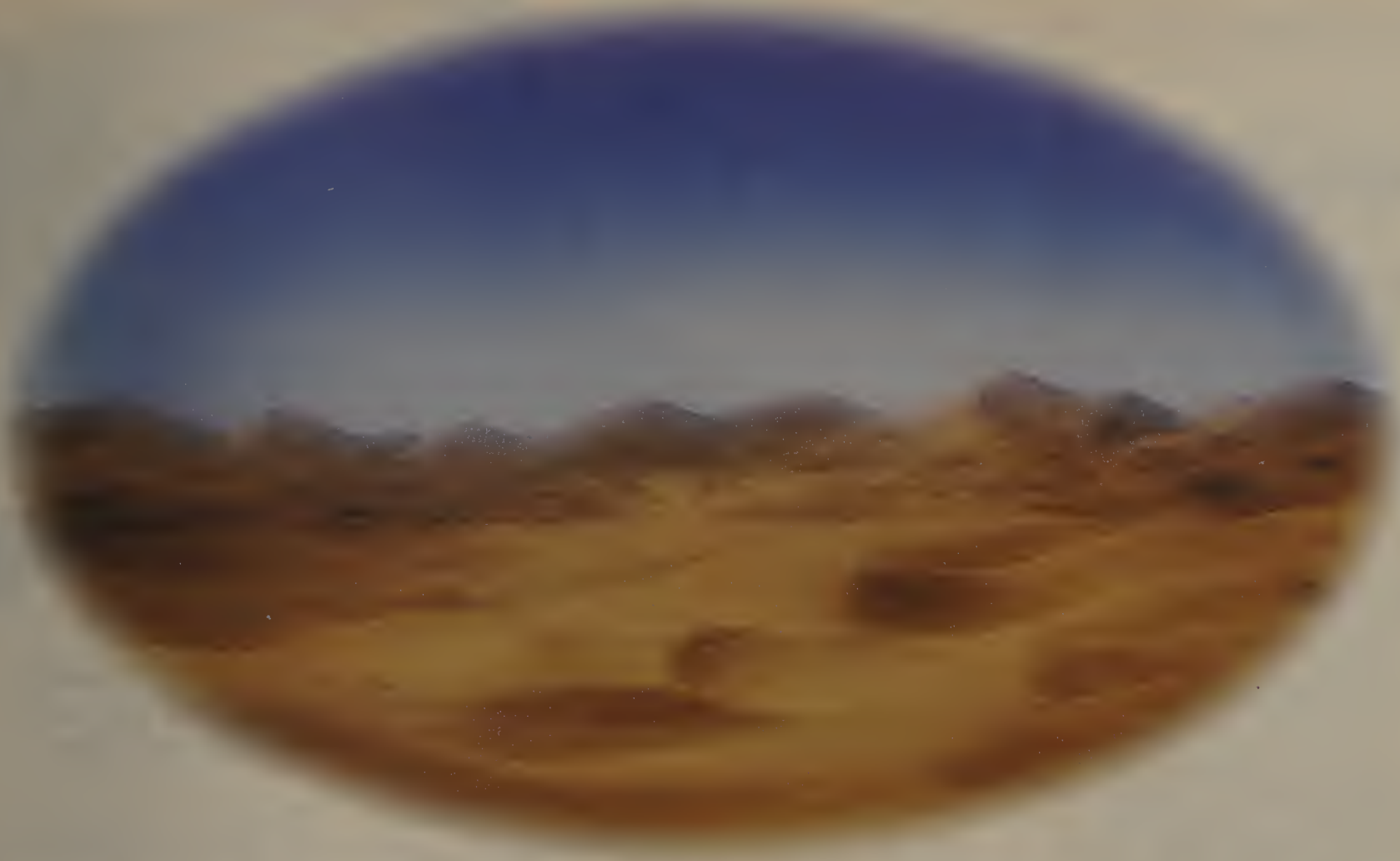
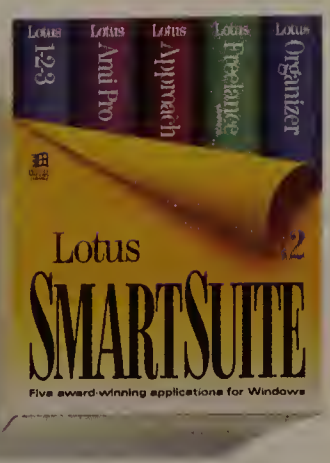


TER TAKE A CLOSER T OFFICE AFTER ALL.

into believing that Microsoft Office is workgroup enabled. When, in fact, Office can only integrate applications, SmartSuite can actually integrate entire groups of people. With Lotus Notes® groupware, SmartSuite users can access, share, track and manage business data like never before. Not only can it be routed, it can be revised, stored and accessed concurrently by multiple users working in collaboration.



And right now, you can upgrade from any Lotus or competitive product to SmartSuite 2.1 for just $299.** Just visit your Lotus Reseller. Or call Lotus for a demo disk at **1-800-TRADE-UP, ext. 9345.*** We can assure you, this is one time you really will be able to believe your eyes.

Lotus.
Working Together®

playWrite,® PowerPoint, Harvard Graphics,® Corel Draw, WordPerfect Presentation, Aldus® Persuasion, dBase,® Paradox,® Access, SuperBase and Filemaker. Qualifying Lotus products include 1-2-3 (excluding 1-2-3 for Home), eelance Graphics, Lotus Notes, Symphony, Graphwriter and Working Together are registered trademarks and Lotus Organizer, Version Manager and Notes/FX are trademarks of Lotus Development Corporation. Approach demarks of Microsoft Corporation. Borland, Quattro, dBase and Paradox are registered trademarks of Borland International, Inc. WordPerfect is a registered trademark of WordPerfect Corporation. Wordstar is a registered rvard Graphics is a registered trademark of Software Publishing Corporation. Aldus is a registered trademark of Aldus Corporation.

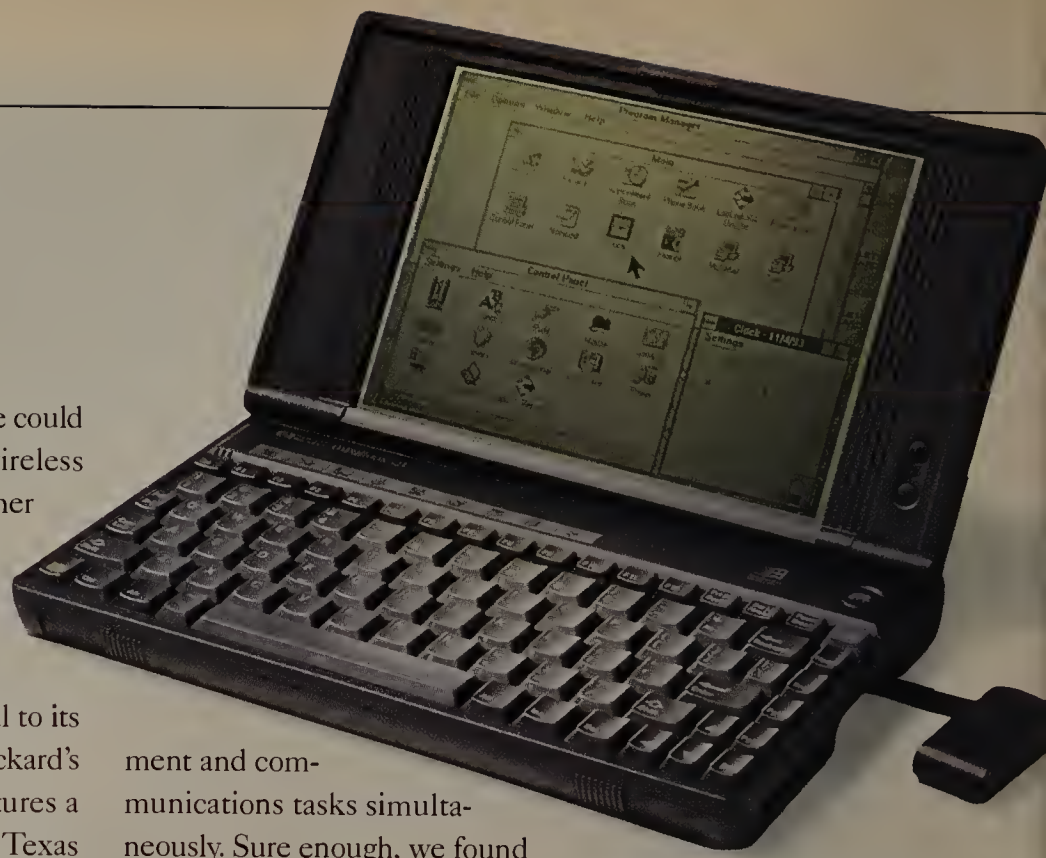
OmniBook Gets 486

TEST DRIVE ▶ Introduced last summer, the Hewlett-Packard 3-pound OmniBook 300 brought several innovations to the subnotebook market. They included a miniature pop-out mouse, a wireless infrared link for transferring files, and a diskless model that stores data on PCMCIA memory cards. Unfortunately, these innovations didn't necessarily result in a better subnote. The miniature tethered mouse could be hard to use, the wireless link worked only with other HP products, and the diskless model came bundled with a measly 10MB of storage space.

While virtually identical to its older sibling, Hewlett-Packard's new OmniBook 425 features a faster microprocessor: Texas Instruments' 25-MHz 486SLC, a 486SLC/e hybrid with an internal 1K cache and a narrow 16-bit data path (similar to the now-ancient 386SX). By comparison, the OmniBook 300 uses AMD's slower 386SXLV, a 386SX clone.

Users of high-speed modems will definitely prefer the OmniBook 425. In *PC World* tests, the OmniBook 300 had problems running data communications sessions faster than 4800 bits per second. According to OmniBook product manager Marcia Coffee, the 425's Texas Instruments processor has more power for multitasking, including handling power management and communications tasks simultaneously. Sure enough, we found the OmniBook 425 worked just fine with our 14.4-kbps AT&T Paradyne modem.

Like the OmniBook 300, the 425 is built for Windows but lacks the muscle to do the job. The unit comes with 2MB of RAM and several Windows applications in ROM, including Microsoft Word and Excel, LapLink Remote Access, a scheduler, a phone book, and a PIM. If you plan to multitask several Windows apps or run a DOS session in a window, you'll want to purchase an additional 2MB of RAM ($179). The OmniBook 425 with a 10MB flash disk is $2375; with a 40MB hard disk, it's $2125.



MULTITASKING POWER comes to the OmniBook 425, thanks to its 486SLC/e processor.

The new OmniBook retains the original's nonbacklit LCD screen, which is hard to read in dim lighting. HP claims the unit can run for 8 hours using a flash disk and 4½ hours with a hard disk. The wireless file transfer utility still works only with HP's Vectra desktops, other OmniBooks, and the HP 100LX hand-held unit, although the company says that it is working on licensing its infrared technology to other PC manufacturers.

—Jeff Bertolucci

OmniBook 425

New 3-pound subnotebook boasts better performance.
Key Features: Texas Instruments 486SLC/e CPU • Pop-out mouse • Wireless file transfer utility • Windows apps in ROM
Pricing: With 10MB flash disk $2375, with 40MB hard disk $2125
Availability: Immediate
Hewlett-Packard, 800/752-0900
Reader service no. 704

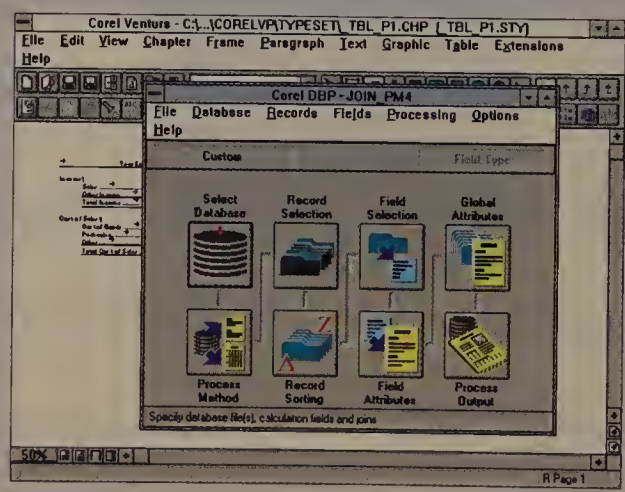
Corel's DTP Venture:

Will high-end DTP software prices plunge in the wake of Corel's purchase of Ventura Publisher and introduction of the $249 version 4.2, priced $500 less than competitors PageMaker, QuarkXPress, or FrameMaker?

Not right away, say industry experts, even though Corel is also throwing in Corel DataBase Publisher 4.2, Adobe Acrobat Reader, Ventura Separator, Ventura Scan, 75 slick document templates, and two CD ROMs containing over 600 Bitstream TrueType and Type 1 fonts, 10,000 pieces of clip art in EPS format, and 100 royalty-free Kodak PhotoCD photographs.

Corel's low pricing is unlikely to influence its competitors, says Rick Altman, author of four books on Ventura. "Ventura has slid so far in popularity that Aldus and Quark probably will not drop their prices yet."

Dataquest's principal analyst for work-group computing, Chuck Stegman, concurs. "Right now in desktop publishing, market share determines price....Switching page layout programs is not easy." Though its $249 price will attract companies entering the field, Stegman believes there aren't enough such firms to influence pricing much.



The price stability may change when Corel incorporates Ventura in the next CorelDraw upgrade. Corel says version 5.0 will concentrate on usability and conformity with Windows' interface. An easier-to-use Ventura Publisher bundled with CorelDraw could provide all the graphics and DTP features most PC users would ever need. Corel Corp., 800/772-6735. Reader service no. 705

JOHN GREENLEIGH

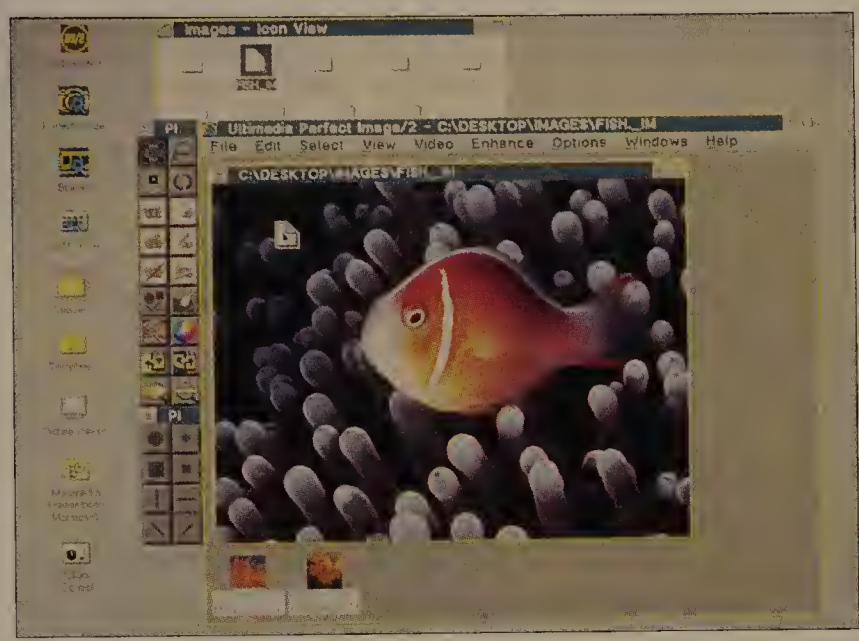
OS/2 Multimedia Presentations

TEST DRIVE How would you like to pack a secret weapon in your presentation arsenal that gives you the combined power of Software Publishing Corporation's Harvard Graphics and Asymetrix's Multimedia ToolBook? That sort of power exists, but you'll find it in an unexpected place, wearing IBM blue and running under OS/2.

The new Ultimedia tools built into OS/2 2.1 run circles around anything in Windows, but until recently they represented only raw potential. With the release of a new multimedia authoring trio, however, IBM is stepping to the forefront of business graphics.

Ultimedia Builder/2 combines a multimedia authoring studio, similar to Multimedia ToolBook, and a business graphics application, in the realm of Harvard Graphics (although it lacks some of the highly evolved ease-of-use features in Harvard Graphics version 2.0). A companion product, Ultimedia Workplace/2, is the best multimedia browser-and-management system I've seen, and Ultimedia Perfect Image/2 is a well-executed scanner and image-editing application.

Ultimedia Builder/2 achieves its flexibility by combining two user interfaces. One uses a visual drag-and-drop structure, and the other resembles a traditional programming or scripting language. While the latter offers more power, you need never deal with it for most business projects. The "stories" you create with Builder can contain images, sound, video, text, animation, and special effects, enabling you to enhance such normally mundane items as E-mail messages and word processing documents in addition to formal presentations and trade show demos. The scripting language, AVA/2 (Audio Visual Authoring), is based on IBM's REXX scripting language. A run-time feature lets you play back your presentations on any OS/2 machine.



RESIZE, COPY, PASTE, AND ROTATE IMAGES with Ultimedia Perfect Image/2. You can capture images from a variety of sources.

When you launch Ultimedia Workplace/2, it finds every file in your system, including text, audio, and video files, and gives you a simple visual index to them. Double-click on a file and it will show or play. Ultimedia Workplace/2 also works with relational databases and even allows you to manage offline materials, an ingredient sorely missing from the multimedia management tools emerging in the Windows world.

Ultimedia Perfect Image/2 provides the final ingredient, allowing you to capture images from a video camera, VCR, video disk, still video camera, or television; edit them; and save them in a variety of formats.

If you haven't yet experienced OS/2 multimedia, you'll discover it's completely different from the sometimes cheesy experience offered by Windows multimedia.

IBM's implementation uses less disk space, plays back at twice the frame size, and doesn't suffer as much signal loss and jerkiness. Because it's OS/2, your spreadsheet can recalculate in the background while your animation plays.

—Joe Abernathy

Ultimedia Software

Three OS/2 multimedia tools to help you build dazzling presentations that will blow away any Windows challengers.

Key Features: REXX scripting language • Visual index of all files • Multiple input sources supported

Pricing: Ultimedia Builder/2 $345, Ultimedia Workplace/2 $345, Ultimedia Perfect Image/2 $175

Availability: Immediate

IBM, 800/426-9402

Full-Screen PC Video

A new standard is bringing digital video up to snuff. Known as MPEG (Motion Picture Experts Group), this video file format lets PCs play full-screen video without losing frames or displaying grainy images.

Among the first products to feature MPEG video playback-only is Sigma Designs' ReelMagic board. While digital video often suffers from low resolution and slow frame rates—particularly on slower 386s—ReelMagic's MPEG hardware handles all video processing to deliver TV quality, regardless of the system.

ReelMagic's on-board chip decompresses MPEG video files, displaying 32,000 colors at resolutions as high as 1024 by 768. The video plays at a smooth 30 frames per second, even when running off single-speed CD ROM drives operating at 150 kilobytes per second, while a built-in sound adapter provides CD-quality audio. ReelMagic costs $449. Sigma Designs, 800/845-8086, 510/770-0100, 510/770-2640 (fax). Reader service no. 707

GORDON STUDER

20 years.

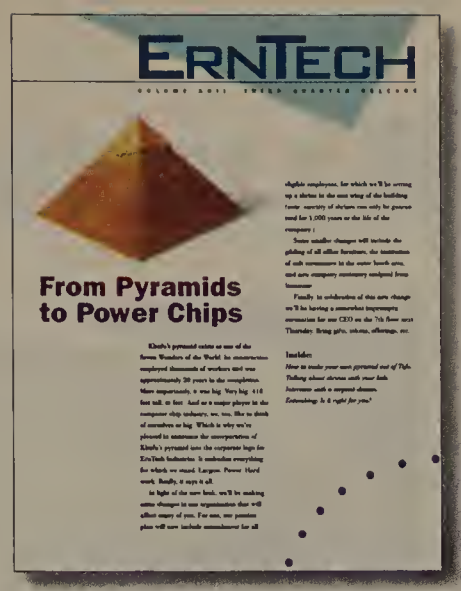
100,000 men.

752 casualties.

Introducing the new HP ScanJet IIcx. Scans done easily for just

$1,179.

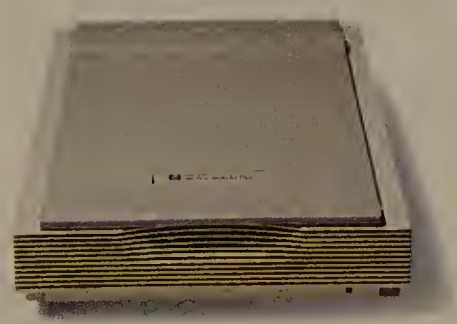
It's that simple. A click, a pass, an image—ready to be saved or incorporated into any document. With the added efficiency of HP DeskScan software, the HP ScanJet IIcx captures images in seconds. And with a TWAIN interface, you'll never have to leave your document to get them.



One click.

One pass.

One scanner.



But simplicity is just part of the story. The HP ScanJet IIcx provides 256 levels of gray, 24-bit color, and 1600-dpi enhanced resolution (400-dpi optical) for scans that are always detailed, always accurate. HP's AccuPage 2.0 technology aids third-party OCR software in recognizing hard-to-read text, thereby speeding up text scans. And Aldus™ PhotoStyler™ SE software allows you to edit scanned images without the need for additional software. Available as options are an automatic document feeder and our new transparency adapter.

With all this, it's easy to see why we're the number one PC scanner. So call now at 1-800-SCANJET, Ext. 7802† for more information or for the name of your local authorized HP dealer.

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PE 12368

Mwave: Your Digital Office Assistant

TEST DRIVE

The latest generation of PC-based tools for the small office and home office combines computer and telephony technology to create digital office assistants that take your clients' calls, entertain them with music if they're put on hold, and send and receive faxes.

The first of these products are arriving now from companies such as Best Data Products and Spectrum Signal Processing. Based on the Mwave Digital Signal Processor, DSP, and associated chip sets from IBM, they are coprocessor boards and software that take a major step toward winnowing out the number of stand-alone electronic devices in the office and integrating them into the PC.

The move toward integration began over five years ago when the first modem maker added fax to its products, obviating—or at least reducing—the need for a separate fax machine. More recently, voice-ready modem chips have spawned a series of products that turn your PC into a combination telephone answering machine and fax-data messaging center. Now, Mwave-based boards are cresting on the market with additional multimedia capabilities, such as a MIDI and CD ROM interface. They work simultaneously with earlier answering machine and fax-modem technologies to create a sea of possible applications that merge fax, data, voice, and video features.

The key to achieving these multitasking features is the DSPs. These programmable processors can perform a number of specialized functions, removing the burden of these tasks from your PC's processor in the process. Furthermore, they are easy to upgrade. For example, in an Mwave-based board, you'll be able to upgrade your 9600-bps modem to a 14.4-kbps modem just by installing the appropriate software from a disk, instead of having to pull the old modem from your PC and replace it with a new one.

DSPs are already used in a few modems, video boards, and sound boards. But their real utility is in the rapidly evolving communications and video worlds, since they allow users to upgrade their systems just by adding new software.

Digital Receptionist

Applications being developed by Best Data Products and Spectrum Signal Processing will enable Mwave-based boards to act as an advanced answering-machine and message-handling system for the home office.

Since the Mwave DSP acts as a coprocessor, you can run concurrent tasks. For instance, you could have it answer the phone while you review messages, then put callers on hold and entertain them with music, advertisements, and the like from a CD. Other possible applications for Mwave-based products include low-cost video teleconferencing, which sends voice and data simultaneously over the same phone line, and full-duplex speakerphones, which eliminate awkward pauses. And since Mwave boards run independently of the system processor, your PC can chug away performing desktop tasks such as formatting documents and recalculating spreadsheets while the Mwave board handles all your communications, sound, and voice tasks.

The ACE board from Best Data, which should be available by the time you read this, is a 16-bit bus-mastering card. It comes with a 14.4-kbps fax-modem, a digital voice feature, a MIDI synthesizer, 16-bit sound, and a CD ROM connector. It should list for $259. Spectrum Signal Processing had not set a price for its Spectrum Envoy board at this writing. It contains a telephone management system, 14.4-kbps fax-modem, and sound capabilities.

—Bryan Hastings

Mwave Boards

Two Mwave-based boards that promise to take small office communications automation to the next level.

ACE

Key Features: Fax-modem • CD ROM connector • MIDI connector
Pricing: $259
Availability: Immediate
Best Data Products, 800/632-2378, 818/773-9600
Reader service no. 708

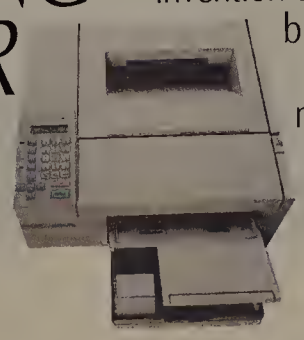
Spectrum Envoy

Key Features: Fax-modem • Sound • Telephone management system
Pricing: To be announced
Availability: End of January
Spectrum Signal Processing, 604/421-5422
Reader service no. 709

GORDON STUDER

TO WIN THE PAPER CHASE

STOP CHASING PAPER



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Circle 140 on reader service card

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a Division of Oki America, Inc.

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Vroooom! When you're on the road, there's no time to slow down for faxmodem hassles. And with Intel PCMCIA cards, you'll go from zero to faxing in no time.

Just insert the PCMCIA card into any Type II or Type III slot. Unlike other cards, Intel faxmodem cards require no powering down, no reconfiguring, and no com ports to set.

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Of course the card is made for the road. With a built-in

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intel®

Circle 109 on reader service card

Introducing Delrina Communications Suite. At last, powerful fax and communications software that work together.

Get a suite deal on WinFax PRO™ and new WinComm PRO™

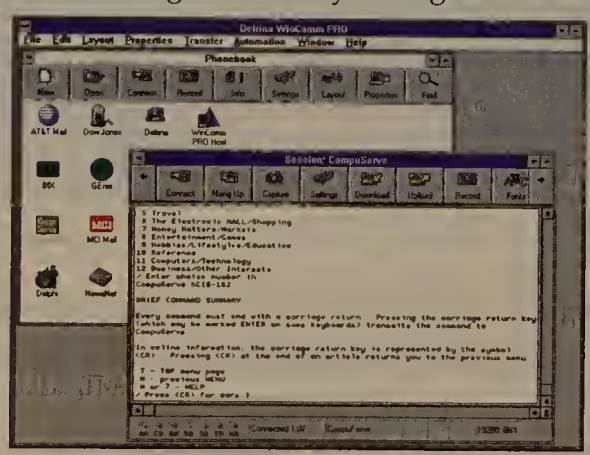
Now you can get the world's best-selling fax software together with a powerful new communications application in one economical package: New Delrina Communications Suite™.

Together, WinFax PRO and new WinComm PRO set a new standard for ease-of-use and integration. In fact, for the first time you'll be able to run both fax and data communications software without the hassle of serial port conflicts.

New WinComm PRO - the easy way to access on-line services and transfer files

With WinComm PRO's friendly graphical interface and intuitive icons, access to advanced communications is easier than ever. Lots of pre-defined scripts are included to automatically connect to all major on-line services, including CompuServe, MCI Mail, AT&T and GEnie. Plus, it's a cinch to record log-on scripts of your own. Or use the powerful scripting language to customize and automate all your on-line sessions. You'll find support for all the popular terminal emulations. As well as additional support for just about every file transfer protocol you might need, including Xmodem, Ymodem, Zmodem and Kermit. Plus on-line virus protection.

Only WinComm PRO gives you power and flexibility in data communications, with the same ease-of-use that made WinFax PRO number one in PC faxing.



Like award-winning WinFax PRO, new WinComm PRO gives you push button access to its powerful features.

WinFax PRO - the best way to send, receive and manage faxes

Plus, you get Delrina's award-winning WinFax PRO. With over 2 million copies of WinFax sold worldwide, we think you'll agree it's the best way to send faxes from any Windows application. It even lets you receive faxes in the background, organize your faxes with a detailed log, design your own cover sheets, and convert faxes into word processing documents with OCR.

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Circle 171 on reader service card

AST Offers More Multimedia for Your Money

AST Advantage Adventure series

These affordable multimedia PCs include double-speed CD ROM drives and 16-bit stereo sound cards.

AST Research Inc.
800/876-4278,
714/727-4141,
714/727-9355 (fax)
List price: starts at less than $2000
Reader service no. 654

Everybody's selling multimedia systems. But what do you get? A slow-as-molasses single-speed CD ROM drive or a double-speed drive that plays motion video? A poor-quality 8-bit sound card or a 16-bit card with CD-quality audio? And what about the monitor, speakers, and microphone?

AST's new Advantage Adventure PCs, targeted at small-office and home users, are inexpensive multimedia systems. Complying with the Multimedia PC Marketing Council's MPC Level 2 multimedia specification, each Adventure model offers a double-speed (300-kilobytes-per-second data transfer rate) CD ROM drive that does an adequate job of playing video clips. It includes a 16-bit stereo sound card, external speakers, a microphone, and local bus video with 1MB of video RAM that's expandable to 2MB on the 66-MHz 486-DX2 model.

Easy Installation

However, the specs tell only part of the story. AST makes it easy to get your multimedia Adventure running, thanks to an illustrated Quick Start chart that guides you step-by-step through installation. Turn on the system, and Windows loads automatically. Preinstalled CD ROM titles include Microsoft's Encarta and Multimedia Works, Broderbund's Where in the World Is Carmen Sandiego?, and Kodak's Photo CD software. To use Encarta, for instance, you simply load the Encarta CD and click the Encarta icon.

The Advantage Adventure comes in a variety of configurations. The unit we tested featured a 33-MHz 486SX processor, a 256K secondary cache, 8MB of RAM, a 210MB hard drive, and a 3½-inch floppy drive. With a 14-inch color monitor and all the multimedia goodies, this system should sell for around $2000, according to the company.

Sound and Video

As configured, our Adventure 486SX/33 was fast enough for the multimedia games and education software that came with it. The Creative Labs SoundBlaster 16 audio card and Labtec CS-150 speakers produced high-fidelity stereo output. The double-speed CD ROM drive, also from Creative Labs, did a respectable job of playing Video for Windows clips. The drive's motorized tray made loading CDs easy, and its stereo phone jack was convenient for connecting headphones or an earphone to the drive.

Although our Adventure 486SX/33 was capable of displaying resolutions up to 1024 by 768 pixels with 256 colors, we found the 14-inch monitor too small to show anything other than standard VGA—unless you enjoy viewing your display with a magnifying glass. To take full advantage of the multimedia experience, we suggest a 15-inch or larger monitor.

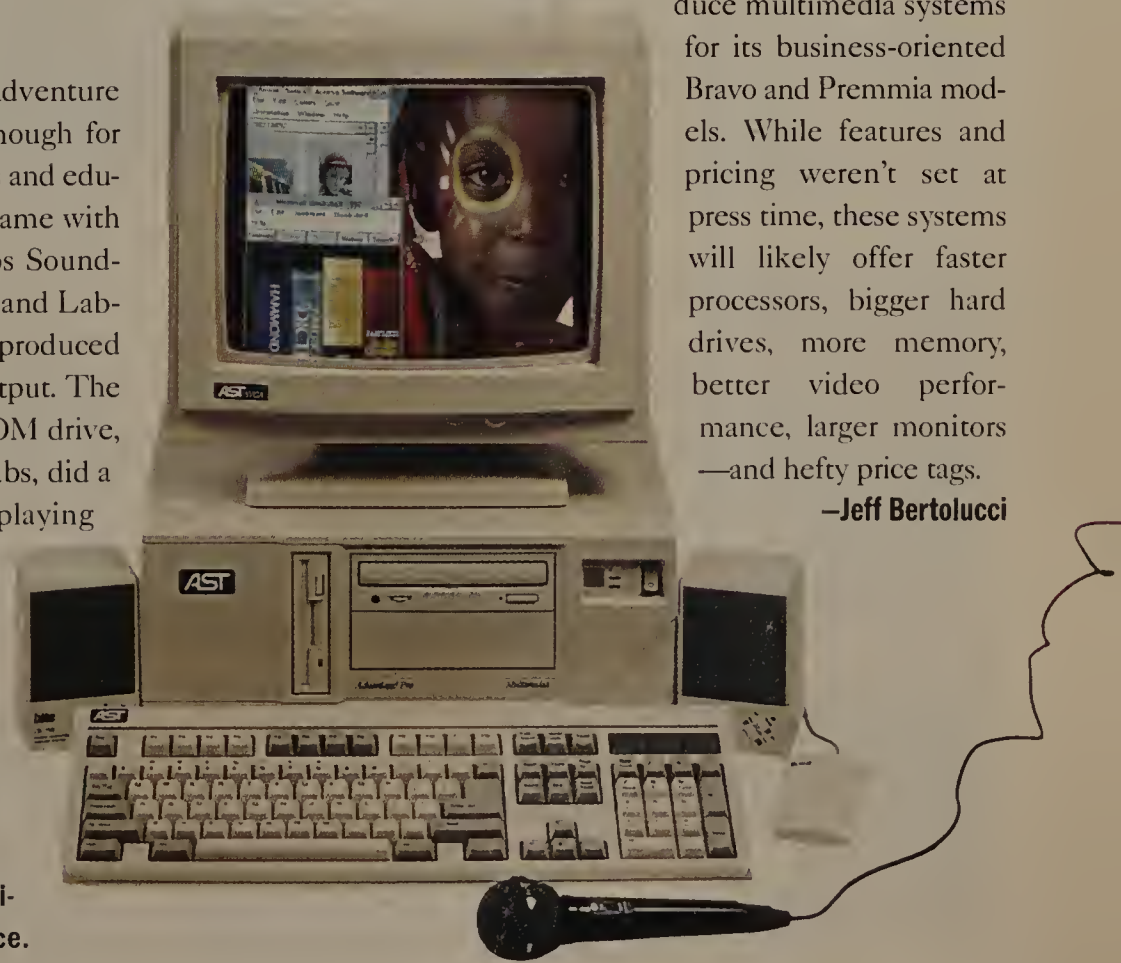
Fax, Data, and More

Each Adventure includes an internal fax-modem and preloaded Prodigy, America Online, and Delrina WinFax software. The fax-modem sends and receives data files at 2400 bits per second (bps); it sends faxes at 9600 bps and receives them at 4800 bps. Since the machine ships without any system software disks, you also get AST's Disk Utility, which pops up every time you load Windows until you break down and agree to copy your system's software to floppy disk.

For expansion, each Adventure desktop unit offers two open ISA bus slots and two open drive bays. If you need more room for add-on boards, note that the Adventure 486-DX2 minitower comes with four open ISA slots. All AST Advantage products include lifetime toll-free technical support and one year of free on-site service.

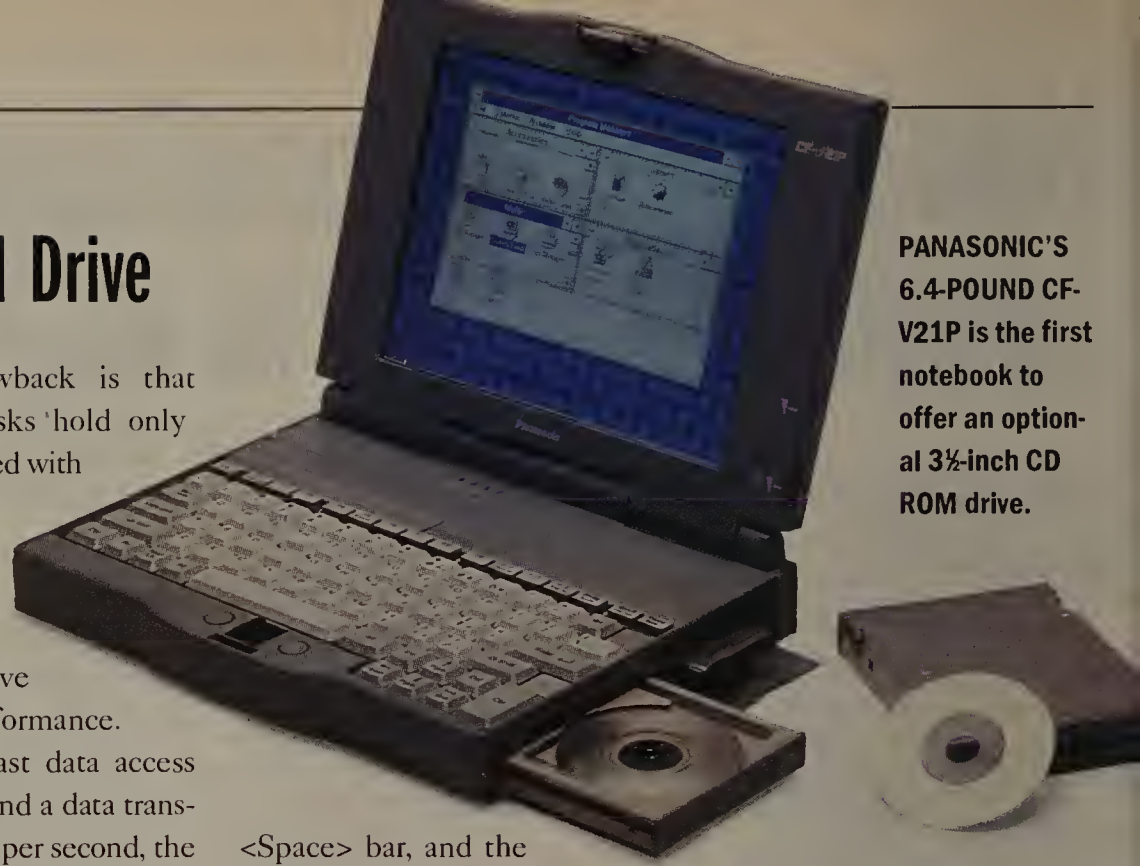
While the Advantage Adventure line is fine for playing low-end multimedia titles like CD-based encyclopedias, games, and education software, a corporate developer building applications that use sound, animation, and video will likely need a more powerful computer. For this reason, AST plans to introduce multimedia systems for its business-oriented Bravo and Premmia models. While features and pricing weren't set at press time, these systems will likely offer faster processors, bigger hard drives, more memory, better video performance, larger monitors—and hefty price tags.

—Jeff Bertolucci



AST'S ADVENTURE 486SX/33 brings multimedia to the home office.

Notebook Has Tiny CD ROM Drive



PANASONIC'S 6.4-POUND CF-V21P is the first notebook to offer an optional 3½-inch CD ROM drive.

Panasonic's new 6.4-pound multimedia note boasts a 10.4-inch active-matrix color display and an optional 3½-inch CD ROM drive, an industry first.

The CF-V21P notebook features a new breed of CD ROM drive that reads 3½-inch disks instead of the standard 5¼-inch disks. This smaller drive weighs just 0.7 pounds. Adding a CD ROM drive to other notebooks can almost double a unit's weight. For example, adding a multimedia docking station, which includes a CD ROM drive and speakers, to IBM's ThinkPad 750C brings the unit's total weight to an arm-wrenching 13 pounds.

Unfortunately, you can't read 5¼-inch disks in this drive, so most popular CDs won't work in it. Hence, the CF-V21P equipped with the CD ROM drive will be practical only for people with access to CD recording devices or for corporate departments dedicated to creating these custom disks. (A standard CD recording device can write to these small disks. Likewise, 3½-inch disks can be read by 5¼-inch drives.)

Another drawback is that the 3½-inch disks hold only 180MB, compared with 650MB on the 5¼-inch disks.

On the plus side, the smaller CD ROM drive offers solid performance. It provides a fast data access time of 210ms and a data transfer rate of 300K per second, the rate recommended by the Multimedia PC Marketing Council's MPC Level 2 multimedia guidelines. The drive fits into a slot normally reserved for the notebook's floppy drive. (This slot can also house a second battery.) On a preproduction unit, it was easy to replace the floppy drive with the CD ROM drive: You flip a lever beneath the <Space> bar, and the drive pops out.

The active-matrix color notebook costs $4199, plus $499 for the CD ROM drive. A monochrome model, which weighs 5.7 pounds, costs $2599. A pen-input LCD model weighs 5.7 pounds and costs $2999. All use a 25-MHz 486SX processor. They include 4MB of RAM upgradable to 20MB, a 120MB hard drive, a trackball, and two Type II PCMCIA slots. To complete your multimedia machine, you'll need a PCMCIA sound card and speakers.

The monochrome note runs 2½ to 7½ hours on nickel–metal-hydride batteries; the color unit about 1½ to 4½ hours, the vendor claims.

—Laurianne McLaughlin

Panasonic CF-V21P notebook

A 6.4-pound notebook with a 10.4-inch active-matrix color display and an optional 3½-inch CD ROM drive.
Panasonic Communications & Systems Co.
800/742-8086
List price: active-matrix $4199, monochrome $2599, with pen LCD $2999; CD ROM drive $499
Reader service no. 655

It's a Tablet! No, It's a Notebook!

Daring to tread in the dark and dangerous forest of handwriting recognition, Compaq's innovative Concerto notebook may actually be charting a safe course. Rather than marketing the machine for its pen capabilities, Compaq is touting the Concerto as a fully functional notebook that happens to have a pen and a detachable keyboard.

The Concerto, with a base price of $2499, is Compaq's first computer to include PCMCIA, and it features the nicest implementation of PCMCIA we've yet seen, with intelligent plug-and-play for more than 140 PCMCIA cards. Our unit had no trouble sensing a SunDisk flash memory device and a Megahertz XJack Modem. To extend battery life, the Concerto can shut off power to its two Type II PCMCIA slots.

The electronic pen works with Microsoft Windows for Pen Computing. It's highly effective at replacing the pointing device found on many of today's notebooks. Less effective is the handwriting recognition, which we found to be inaccurate and slow when used with InkWare NoteTaker and PenPower for Excel, two applications that are bundled with the Concerto.

With a 9½-inch MaxLight display, the Concerto includes either an Intel 486SL-25 or 486SL-33 processor. You can drive the internal screen and an external monitor in 256 colors at 640 by 480 resolution. The 25-MHz Concerto comes with a 120MB or 250MB hard drive; the 33-MHz unit has a 250MB drive. The standard 4MB of RAM is expandable to 20MB. A 3½-inch floppy drive is included. Weighing 6.5 pounds with the keyboard and 5.2 pounds in its tablet mode, the Concerto runs 3½ to 4 hours with standard power management options enabled, the vendor claims.

—Joe Abernathy

Compaq Concerto notebook

An innovative portable computer with plug-and-play PCMCIA and pen enhancements.
Compaq Computer
800/345-1518
Estimated street price: beginning at $2499
Reader service no. 656

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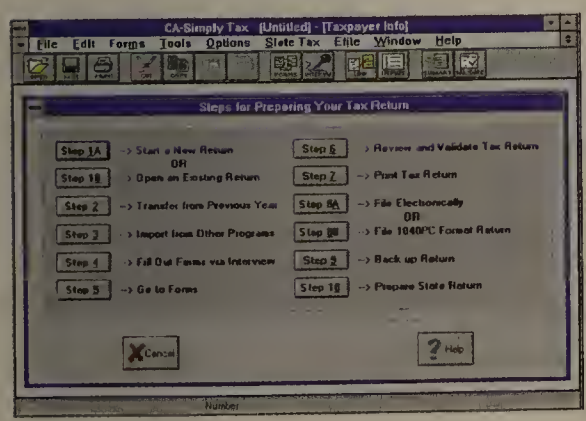

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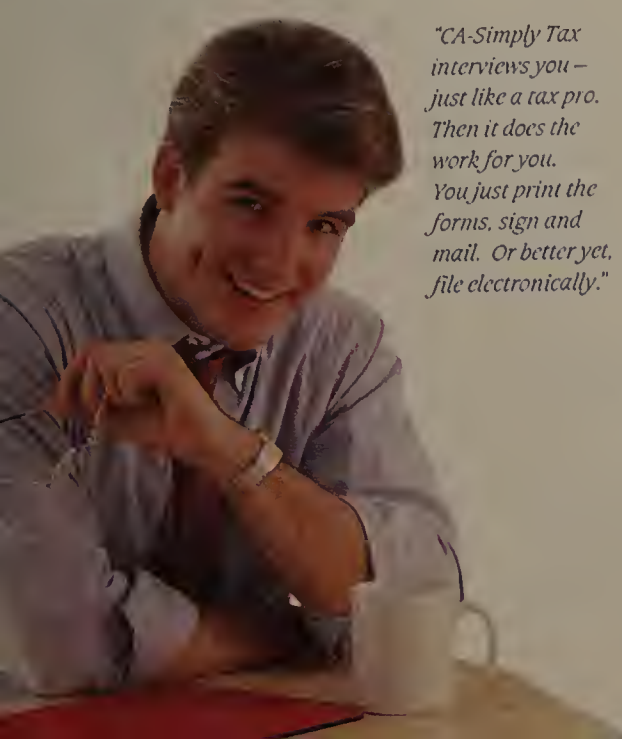

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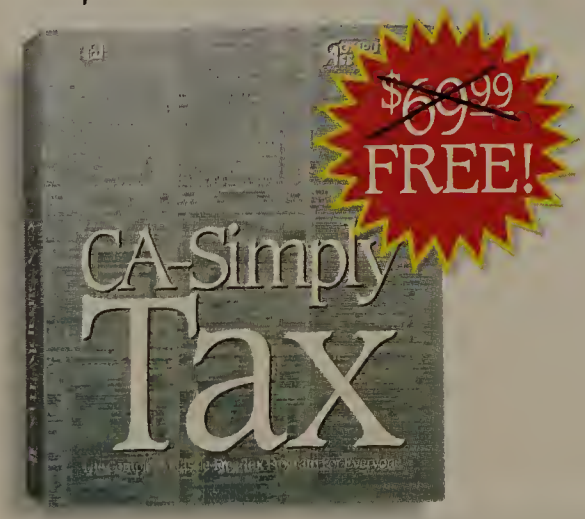

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*There is a nonrefundable $9.95 shipping and handling charge. (Allow up to 3 weeks for delivery.) Have your credit card ready: Visa, MasterCard, AmEx and Discover accepted. Only available in the US. Windows 3.1: requires 2Mb of RAM (4 recommended) and 5.5Mb of hard disk space. DOS 3.0: 640K (minimum 500K of free RAM required) or greater, minimum 3.5Mb of free hard disk required. Offer valid through April 15, 1994. © Computer Associates International, Inc. Islandia, NY 11788-7000.
All product names referenced herein are trademarks of their respective companies.

Circle 42 on reader service card

Continued on page 98

Color Ink Jets for the Office, Home, and Road

Hewlett-Packard DeskJet 310

Color ink jet printer for the office and the road.
Hewlett-Packard
800/752-0900, 208/396-2551
List price: $379, with sheet feeder $455, color option $49
Reader service no. 657

Canon BJC-600

High-quality color at a reasonable price.
Canon Computer Systems Inc.
800/848-4123
List price: $719
Reader service no. 658

Color ink jet printers are hot. The reason: They offer good output quality for text as well as graphics, at an affordable price. Two recent examples on the market: the Hewlett-Packard DeskJet 310 and the Canon BJC-600.

Positioned as a "companion" printer for portable PCs, the HP DeskJet 310 is designed for use at the office and on the road. In its $379 base configuration, the 310 is a lightweight, 300-dpi, 3-ppm printer. With the $49 color kit, you get a portable color printer that's functionally comparable to HP's popular DeskJet 500C.

The 310 uses a black ink cartridge to print text or a three-color cartridge for color output (blacks printed with the three-color cartridge look a little green). An optional sheet feeder can hold up to 60 sheets of letter-size stock. While the printer can accommodate transparencies and labels, it can't handle envelopes.

If you hit the road with the 310, it'll add 7 pounds (including the sheet feeder) to your load. The printer also has power management features: After 2 minutes of inactivity it enters sleep mode; after 10 minutes of sleep it shuts down. The nickel-cadmium battery recharges whenever plugged in, and the printer has a "drain" mode to alleviate the dreaded memory effect common to this type of battery, which errantly indicates that it is out of power.

The Canon BJC-600 offers good color output at an extremely competitive price. It's aimed at small-office/home-office buyers who want a single printer to produce professional-quality blacks for text and color for charts and graphs.

The BJC-600 produces 360-dpi output from four ink cartridges (cyan, magenta, yellow, and black). The separate black cartridge means that blacks on color pages are pure, not composite. Listing at just $719, the BJC-600 costs exactly the same as the comparable HP DeskJet 550C. (The less expensive DeskJet 500C uses three color cartridges, not four.)

Canon says its new ink dries 100 times faster than conventional inks. In draft mode the BJC-600 produces roughly 3 ppm; in high-quality mode it slows to about 2 ppm. It handles both letter- and legal-size paper (100 sheets at a time) as well as envelopes, transparencies, and adhesive labels.

—Dan Miller

PRINTER COMPANION: HP'S DESKJET 310 weighs 7 pounds and provides 300-dpi color printing on the road.

Laser Printers Get Even Smaller

Panasonic KX-P4400 and KX-P5400

These new laser printers offer upgrade options and smaller footprints unmatched by popular competing products.
Panasonic Communications & Systems Co.
800/742-8086
List price: KX-P4400 $649, KX-P5400 $999
Reader service no. 659

Panasonic's two new low-priced LED laser printers are smaller and more upgradable than their leading competitors, Hewlett-Packard's LaserJet 4L and Okidata's OL-400e. Both Panasonic models offer a 4-ppm engine and 300-dpi resolution. The $649 KX-P4400 and the $999 KX-P5400 sit on their sides and take up about as much desk space as a small loaf of bread. By comparison, the 4L and OL400e need about three times the space.

The Panasonics provide more upgrade options than their competitors. For $479 you can upgrade the PCL 4–equipped KX-P4400 to PostScript Level 2. And you can upgrade the PostScript-capable KX-P5400 (and the upgraded P4400) with an add-on module ($299) that lets you send faxes from your PC and print received faxes on plain paper. The P5400 also lets you add a serial port.

Like the competition, both Panasonics offer a 100-sheet paper tray. The P4400 includes 512K of RAM upgradable to 4.5MB, and the P5400 has 2MB upgradable to 4MB. The P4400 comes with 28 internal bitmapped fonts. When equipped with PostScript, these units offer 17 scalable Adobe Type I fonts. The fax option adds another 18 Type I fonts.

On the downside, the Panasonics don't offer the 4L's Resolution Enhancement technology or the OL400e's RISC processor, which provides fast processing of complex graphics.

—Randy Ross

You Can Play Around With Windows NT On Another Microprocessor.

Putting Imagination

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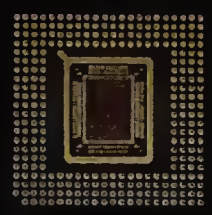
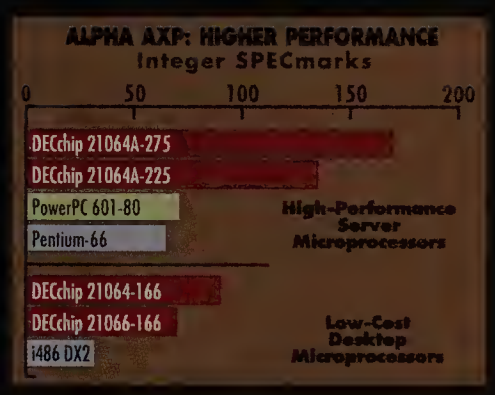


You're going to blaze some new trails with the mainframe power of Windows NT.™ Don't compromise it. Run it on the fastest vehicle you can get—an Alpha AXP™ microprocessor. Choose from a family of fast server microprocessors with performance as high as 170 SPECInt, more than twice that of Pentium™ or PowerPC™—and priced to compete. Or choose from low-cost desktop PC microprocessors with prices that start below an i486.™ Alpha AXP runs Windows NT with thundering speed, as well as your existing DOS/Windows™ applications. And that's just the beginning of a long-term architecture based on a scalable RISC design and standards like the PCI local bus. Available to any PC maker— from us now, and in 1994 from our second source Mitsubishi Electric Corp. The decision with Windows NT is simple. On other microprocessors, it runs. On Alpha AXP, it flies. Which way would you rather cover new ground? Call your PC maker and ask about the Alpha AXP family. Or call us at 1-800-332-2717— and kick start your future.



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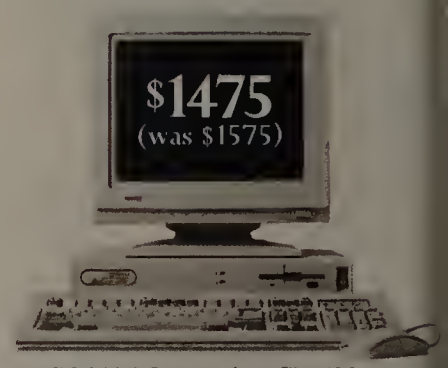

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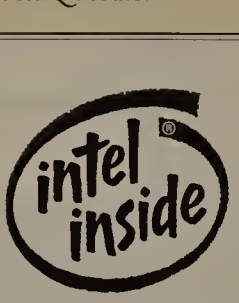

LTE Lite Features

3½" 1.44-MB diskette drive ◆ Power conservation and security features ◆ Auxiliary battery ◆ AC Adapter ◆ MS-DOS 6 and Microsoft Windows Preinstalled ◆ EZ Help On-Line Library ◆ Slipcase ◆ Integrated Trackball and an Expansion Base Connector.

Contura Features

3½" 1.44-MB diskette drive ◆ Power conservation and security features ◆ Battery Pack ◆ AC Adapter ◆ Preinstalled MS-DOS 6, Microsoft Windows 3.1 and EZ Help On-Line Library and a COMPAQ Trackball.

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Circle 83 on reader service card

Continued from page 92

The Integrated Application: Working in the Office or the Suite

Vendors started selling software suites under the simple marketing concept of "more for less." But now they've taken the next step: They've actually made suite applications more valuable as a package than as individual programs, through timesaving integration features and consistent menus, commands, and icons. The latest software suites, Lotus SmartSuite 2.1 and Microsoft Office 4, offer economical solutions and a high level of integration.

Both suites provide a word processor, a spreadsheet, and a presentation graphics program. The package you choose will likely depend on which vendor's applications you prefer. However, if getting more software for your buck is your prime consideration, SmartSuite offers a database and a personal information manager (PIM) for just a few dollars more than Microsoft's product. Office, on the other hand, gives you a single-user E-mail license not found in SmartSuite, plus broader cross-application integration due to its use of Object Linking and Embedding (OLE) 2.0. Both suites offer fairly uniform application interfaces, making the programs they contain easier to learn and use.

SmartSuite

In SmartSuite 2.1, Lotus has added a database program, Approach 2.1, and removed the single-user cc:Mail license. Approach is solid and easy to use and works well with the other applications in the suite. For example, it imports 1-2-3 release 4.0 files directly. Approach also supports Microsoft's Open Database Connectivity (ODBC) standard for data compatibility, promising access to most data formats.

Lotus SmartSuite still includes 1-2-3 release 4.0, Ami Pro 3.01, Organizer 1.1, and Freelance Graphics 2.01. The five-program suite retails for $795; it costs $595 for users of Lotus desktop applications and some competing applications.

Lotus didn't have to improve the suite's appearance, because consistency across applications was already good. As for integration, Lotus's Working Together Bonus Pack, an included set of tools, provides helpful shortcuts for working with multiple applications. For example, the Collect and Copy tool lets you drop a 1-2-3 chart into a Freelance presentation, where it's automatically converted to match the presentation's style.

Office

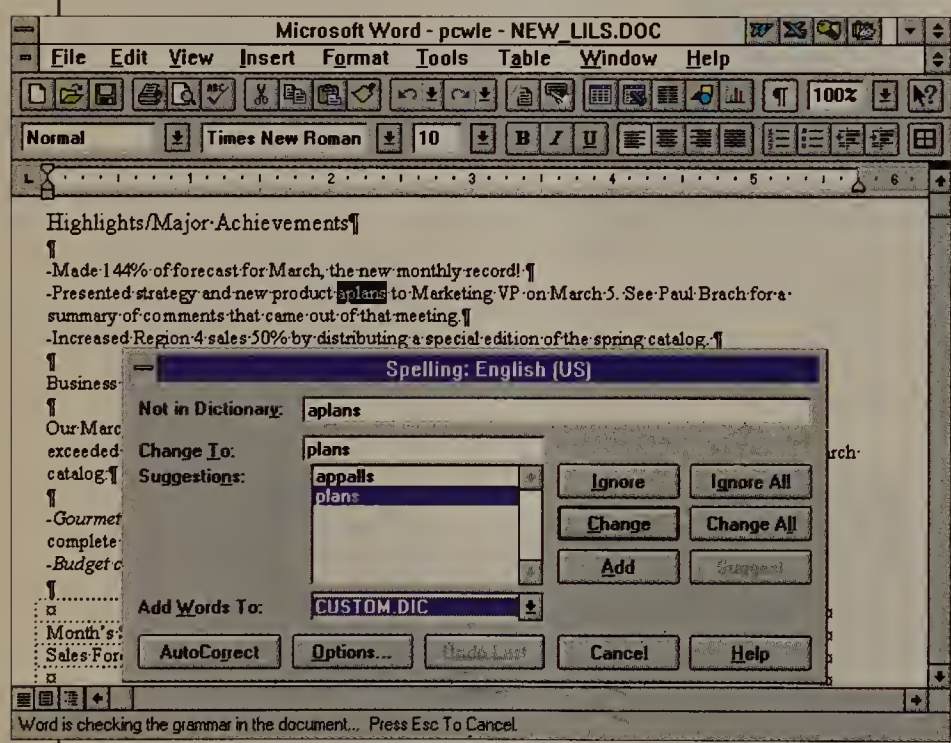
Microsoft has made significant improvements to Office. The product includes Excel 5.0, Word 6.0, PowerPoint 3.0, and an individual-user license for Microsoft Mail. Office retails for $750, $259 for current users of any of the Office apps, and $299 for users of some competing products. To get Microsoft's database application, Access 1.1, you'll need Microsoft Office Professional, which is $899.

The most striking thing about Office is the improved consistency of interfaces. Whether you're in Word, Excel, or PowerPoint, you'll find similar menus, commands, and icons. But the greatest strides made by Microsoft are on the integration front, where it's added OLE 2.0 to Excel and Word. (PowerPoint 4.0, expected in early 1994, will add OLE 2.0 compliance and is free to Office buyers.)

OLE 2.0–enabled applications have two principal advantages. First, OLE 2.0 technology allows you to drag and drop objects, say a chart or a block of text, between OLE 2.0–enabled applications. Second, OLE 2.0 lets you edit an object outside the application where it was created. For example, you can drag and drop an Excel chart into a Word document, then double-click the chart to invoke the graphics tools used by Excel. Your Word menus and icons will change to Excel's charting tools, and you'll be able to edit the chart right then and there from within your document. Click on the document text, and the Word menus and icons are restored. Meanwhile, the data links between the Excel chart in the Word document and the spreadsheet data used to create it are maintained and updated automatically.

Microsoft has also made advances in automating your work, thanks to a set of utilities called IntelliSense tools that speed up work. Finally, new Wizards (dialog boxes with help inside) pop up when the software observes you doing something the long way.

—Laurianne McLaughlin



MICROSOFT OFFICE 4 features the latest versions of the company's most popular business applications, including Word 6.0.

Lotus SmartSuite 2.1

WINDOWS **Lotus adds an easy-to-use database, Approach, to its already strong suite.**

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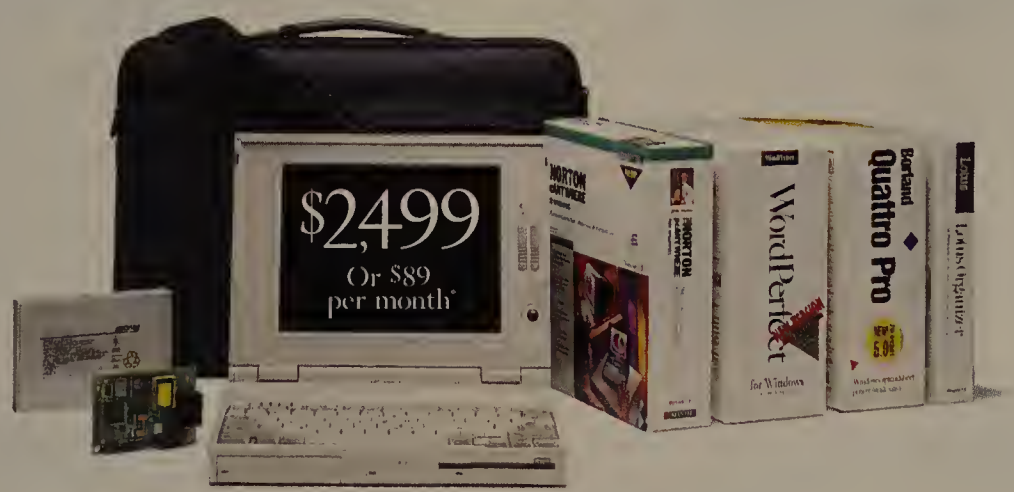

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Circle 20 on reader service card

Business Card Scanners: Some Glitz, Some Glitches

Wouldn't it be great to move the contact data on business cards into your PC without doing any typing? We examined three Windows-based optical character recognition products designed for business cards that promise just that sort of convenience. They speed up the tedious chore but still require some human help for 100 percent accuracy. Our results were satisfactory—but there were some glitches.

We tried the products with ten business cards sporting different colors, type sizes and styles, and name, address, and company formats. Two products we examined come with a dedicated card scanner; the third requires that you provide a scanner. All include a built-in database and/or contact manager, and all can export field data in several formats.

On our 33-MHz 486DX with 12MB of RAM, we waited on average a tolerable 10 to 15 seconds for the products to scan a card, convert the data to machine-readable format, and dump the information into what they considered the correct field in their respective databases. Information that the programs couldn't assimilate accurately went into a small window; we then assigned it to a field.

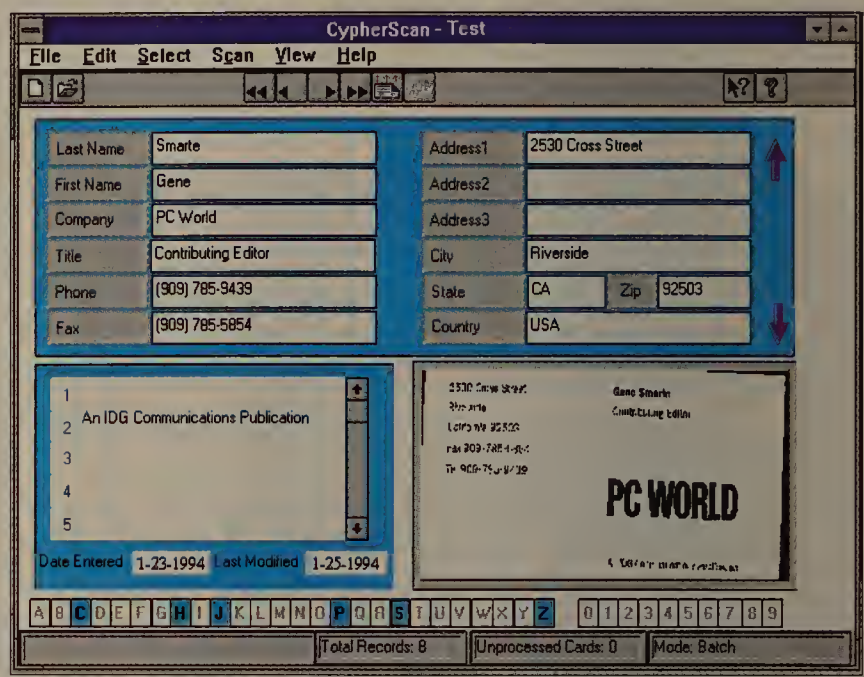
CypherScan 1000

This four-disk $395 package from CypherTech comes with a dedicated card scanner and an add-in board. It also gives you the option of using a third-party flatbed or hand-held scanner. After you create a new contacts database or choose an existing one, you begin scanning cards in either interactive or batch mode. In interactive mode, each card is processed as it's scanned. You can view it, make any needed corrections, and save it. In batch mode, you can run as many cards through the scanner as you have, let them be processed while you do something else, and then edit the results.

You get drag-and-drop editing and all the viewing, sorting, exporting, printing, and importing options you're likely to need. An on-screen tutorial gets you started quickly. Plus, CypherScan works with just about any scanner available. This was our favorite product.

Scan-in-Dex

Microtek's $399 Scan-in-Dex comes with the same dedicated card scanner as CypherScan but works only with this scanner.



CYPHERSCAN 1000 helps you keep track of your business cards. It might even let you see the top of your desk again.

The accuracy of the scans was about the same, and you can process cards singly or in batches. However, you can scan only one card at a time.

We liked the product's capability to have as many as four contact files open at once so you can enter cards into different files without having to presort cards or open and close lots of files. Like CypherScan, Scan-in-Dex accepts vertical business cards, but you must place them in the prescribed orientation.

Cognitive BCR

The $99 Cognitive BCR from Cognitive Technology has the fewest features of the three, but you shouldn't discount it. It's sold separately and in bundles with a variety of scanners. We used an HP ScanJet IIp flatbed scanner (HP is not among the vendors making bundling arrangements with Cognitive) and found adequate results. As with CypherScan, you can do batch scanning. You can also drag and drop unrecognized information into data fields, including a notes section.

You can use Cognitive BCR as a basic contact manager or you can export the data to your favorite database. You can also link a BCR database to your Lotus Organizer address book. Cognitive BCR is the only product of the three that has a built-in telephone dialer.

Good But...

For all these products, we found that about nine out of our ten sample cards required manual corrections in one or more fields. The inability to automatically pluck out a company name buried in or encircled by graphics was a problem common to all three. Even the relatively simple *PC World* logo was not always placed in the correct company field, although with Cognitive BCR you could simply drag the name to the company field to have it recognized.

CypherScan is probably your best choice. The product is loaded with features, and you can buy the program separately to use with your existing scanner ($145 to $245).

—Gene Smarte

CypherScan 1000, Scan-in-Dex, Cognitive BCR business card scanners

WINDOWS **Three business card scanner products that—with some effort—allow you to move card data into database fields.**

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408/734-8763 (fax)
List price: $395, without scanner $145 to $245
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Microtek Lab Inc.
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Cognitive Technology Corp.
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Mr. R. Lee Allen of Schering-Plough, a company already using Prodea Synergy, put it less romantically although no less enthusiastically. "It's not like anything out there before. It's more than OLE or DDE. It transcends both languages and APIs."

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Circle 149 on reader service card

Continued on page 109

Complex Image Editing That Won't Bend Your Brain

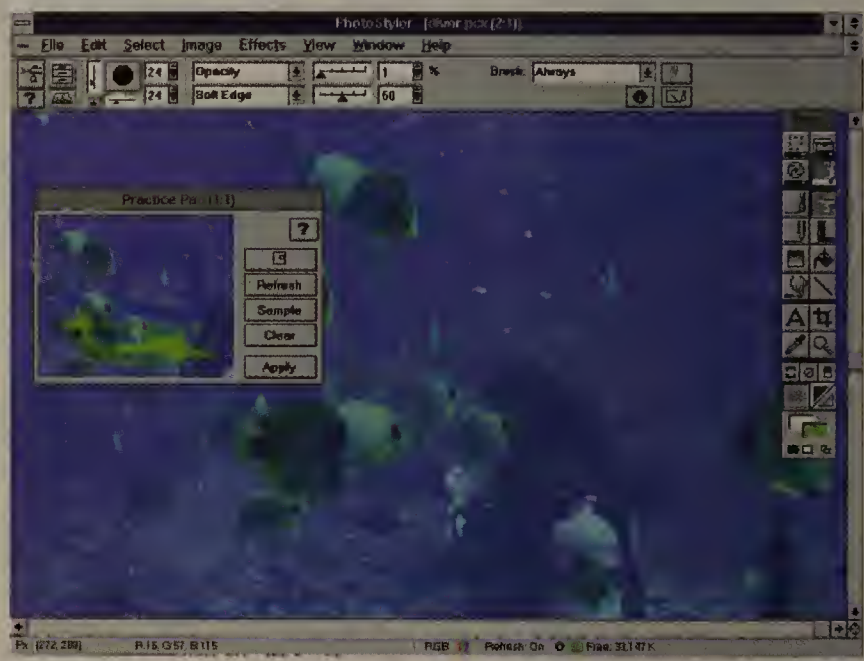
Aldus is shipping version 2.0 of its image editing program PhotoStyler. Designed to compete directly with Adobe Photoshop, PhotoStyler 2.0 targets the nongraphics professional who needs an easy-to-use but powerful image editor.

PhotoStyler boasts some innovative safeguards that prevent users from destroying images while editing them. A Practice Pad lets you see what a brush or an effect will look like before you apply it to the actual image. Multi-Preview lets you look at different effects side by side before you apply them. Much of the interface's ease-of-use capabilities are built on redundancy. There are several options for, say, zooming, so you don't have to hunt for the right menu choice or tool. Fortunately, the tool bar is customizable, so this redundancy doesn't *have* to take over your screen.

Though not available in the beta version we examined, PhotoStyler 2.0 is expected to offer color-proofing capabilities that show you—before you print—the colors you'll get on your output device. Indicate the kind of output and input devices, and PhotoStyler compensates for their idiosyncrasies and displays an output sample.

PhotoStyler is integrated with U-Lead Systems Image Pals 1.2's image browser, which lets you see thumbnails of all your images divided into albums. Want to edit one of those thumbnails? Drag it to the PhotoStyler icon the program loads with your image. Aldus also claims PhotoStyler 2.0 has a tighter integration with PageMaker 5.0 than competitors do.

—Christina Wood



ALDUS PHOTOSTYLER 2.0 has a Practice Pad so you can try out a brush before you make any changes to your image.

Aldus PhotoStyler 2.0

WINDOWS **PhotoStyler provides powerful high-end image editing without bending your brain.**

Aldus Corp.
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Reader service no. 648

Q&A Database Finally Moves to Windows

Now that Windows databases are hot, Symantec has introduced a Windows version of the program that wrote the book on easy-to-use flat-file database managers: Q&A. With its combination of familiar Q&A tools and new graphical additions, Q&A 4.0 for Windows should give other simple Windows database programs such as FileMaker Pro and AceFile a run for their money. Here's what we found in our examination of a prerelease version of Q&A 4.0 for Windows.

At its heart, there's nothing new about Q&A for Windows. It's still a flat-file database that can handle only one file at a time, but it allows you to combine—in a limited way—information from two files into one new file. Symantec has improved the file format to take advantage of Windows, however. For one thing, you can add picture fields to your database. And you can now create multiple forms for a single database. The forms will look much better if you use all the great design tools.

But these changes come at a price: Q&A for Windows must convert a DOS Q&A database before it can read it. And most copies of Q&A for DOS, even of the current version, 4.0, can't read a Q&A 4.0 for Windows file at all. If you want to share data between the two current Q&As, your DOS version must be dated 8/30/93 or later (the $89.95 DOS-to-Windows upgrade kit includes a free upgrade of the DOS version).

Q&A 4.0 for Windows provides a spreadsheetlike table view that's light-years ahead of anything FileMaker Pro—or even the more versatile Approach—has to offer. Not only is the view readable and writable, you can rearrange your table, moving and resizing columns with simple dragging and dropping. And you can save your arrangement for the next time you use the table view.

The old Q&A report writer was showing its age, so Symantec updated this feature in the Windows product. The new band-oriented report writer gives you much more flexibility, although people familiar with the old tool will find its equivalent here too.

As with the DOS version, Q&A for Windows is bundled with a modest word processor that gives you all you need to handle mass mailings.

—Lincoln Spector

Q&A 4.0 for Windows

WINDOWS **A familiar name in easy database management finally turns up in Windows.**

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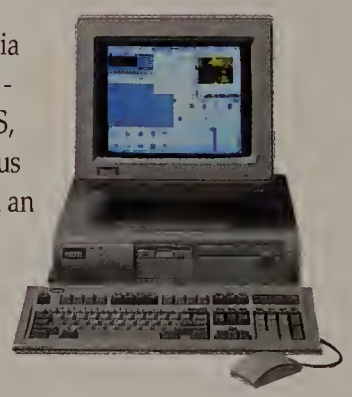

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MEMORY (UPGRADE TO)

5 ☐	8 MB RAM (extra 4 MB)	$230*
6 ☐	16 MB RAM (extra 12 MB)	$690*
7 ☐	32 MB RAM (extra 28 MB)	$1640*
8 ☐	64 MB RAM (extra 60 MB) (not available on 450SL)	$3530*

Call for latest pricing.

CACHE

9 ☐	128 KB cache (not available on 450SL)	$35*
10 ☐	256 KB cache (not available on 450SL)	$59*

3 Each system comes with a 3½" floppy drive and 170 MB IDE hard drive. But you can customize your system to suit your storage needs by adding extra hard or floppy drives. Each Inmac Insignia comes with four drive bays.

HARD DRIVES (UPGRADE TO)

11 ☐	255 MB	$40*
12 ☐	340 MB	$109*
13 ☐	540 MB (requires SCSI interface adapter)	$500*

ADDITIONAL FLOPPY DRIVES

14 ☐	Additional 5¼" FDD	$75*
15 ☐	Replace w/ Dual 3½" and 5¼" FDD	$80*

CD ROM DRIVES

16 ☐	NEC 510 (450 KB/S) (requires SCSI interface adapter)	$389*
17 ☐	Panasonic 563 (150 KB/S)	$199*

4 Each system comes standard with a 14" .28 NI SVGA monitor. You can upgrade to a larger one to have extra room for graphics, desktop publishing, or multiple Windows applications.

MONITOR (UPGRADE TO)

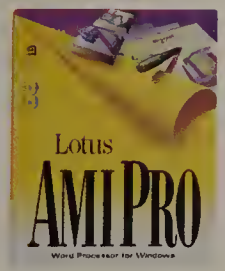
30 ☐	17" .28 NI SVGA Monitor –	$624*

OUR LOW COST LEASING PLAN MAKES EVERYTHING AFFORDABLE RIGHT NOW.

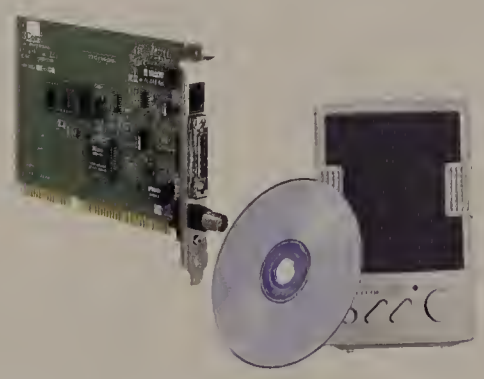
In addition to our low prices, we offer an excellent lease plan to make your Inmac Insignia purchase even more affordable. Payments are as low as $46/month for an Inmac Insignia 450SL priced at $1299. Call Inmac for complete lease option details. Lease prices are based on a 36 month open-end commercial lease. Subject to approved credit with certain terms and conditions. Prices and specifications subject to change without notice.

BUILT TO ORDER • BTO • BUILT TO ORDER • BUILT TO ORDER

5 Each system comes standard with MS DOS, Windows, QA Plus, and Lotus Organizer. We can load any of the latest versions of the hottest selling titles. Check out the bundled suites!



6 Each system comes standard with five expansion slots. Add Ethernet network adapters and a high speed fax/modem to make sure you're well connected. CD-ROM and sound cards are your gateways to the fabulous world of exciting multimedia applications with full motion video and stereo sound.



SOFTWARE**

16 ☐	MICROSOFT WORD	$299*
17 ☐	WORDPERFECT	$289*
18 ☐	LOTUS AMI PRO	$239*
19 ☐	MICROSOFT EXCEL	$299*
20 ☐	LOTUS 1-2-3	$319*
21 ☐	BORLAND QUATTRO PRO	$49*
22 ☐	MICROSOFT MONEY	$15*
23 ☐	BORLAND PARADOX	$129*
24 ☐	MICROSOFT POWERPOINT	$315*
25 ☐	LOTUS FREELANCE	$339*
27 ☐	MICROSOFT OFFICE	$485*
28 ☐	LOTUS SMARTSUITE	$459*
29 ☐	BORLAND OFFICE	$389*

DATA COM/ADAPTERS

31 ☐	3Com Etherlink III Combo 3C509	$130*
33 ☐	Internal 9600/2400 Fax/Modem	$60*
34 ☐	Internal 14400 Baud Fax/Modem	$205*
35 ☐	16-bit Fast SCSI Adapter	$175*

MULTIMEDIA

36 ☐	NEC 510 (450 KB/S) (requires SCSI interface adapter)	$389*
37 ☐	Panasonic 563 (150 KB/S)	$199*
38 ☐	Creative Labs Sound Blaster 16	$199*
39 ☐	Media Vision Pro Audio Spectrum 16	$169*

*Add price to base price of system.
**Software programs are for MS Windows.

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- IBM 486SLC2 25/50 MHz CPU with 16 KB internal cache
- Accelerated local bus graphics with 1 MB display RAM
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- 4 MB RAM, upgradeable to 32 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 433P

K1002PC **$1599**
Lease Option $56/month

- i486 DX/33 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 450P

K1003PC **$1849**
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- i486 DX2/50 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 466P

K1004PC **$1999**
Lease Option $78/month

- i486 DX2/66 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

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Continued from page 104

Windows Sound System: More Features, More Power

Windows Sound System 2.0

WINDOWS **Get the most out of your hardware with this suite of Windows-based sound utilities that supports voice recognition, MIDI playback, and WAV file editing.**
Microsoft Corp.
800/426-9400,
206/882-8080,
206/936-7329 (fax)
List price: $79, hardware version $219
Reader service no. 652

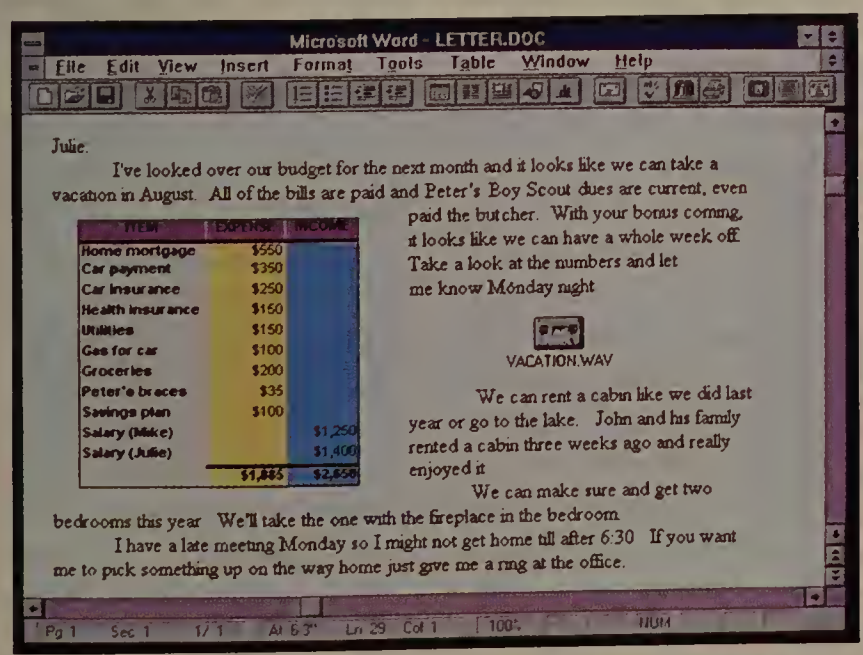
Microsoft's Windows Sound System has gone soft—soft*ware*, that is. The product no longer includes the 8-bit sound card that was bundled with the original software. With this upgrade you get an improved interface and more features, including the capability to work with any 16-bit sound board. Many of the functions are improved, including voice recognition, document proofing, and WAV file recording, editing, and playback.

Sound System 2.0 includes Voice Pilot, a Windows-based voice recognition program that lets you control applications, handle basic data entry, and create macros to speed basic operations. With a 256-word vocabulary, Voice Pilot isn't powerful enough to take dictation for your business correspondence, but it can save a lot of time when you're mousing around by allowing you to issue voice commands to open files or applications, for instance. Built-in Wizards help users get up and running immediately, while a choice of vocabulary training sessions lets you increase the software's recognition rate.

Other Sound System applications include ProofReader, which reads back documents such as spreadsheets and letters, and Sound Finder, which lets you search for sound files, view information, and drag sound clips into OLE-aware documents. Quick Recorder and Sound Editor let you play, edit, and record WAV files and offer more file compression options to save disk space than the previous version of Sound System. Sound System features greater compatibility with popular game software by adding Sound Blaster emulation under DOS. Perhaps more important, the product's setup utility helps you through the sometimes-difficult installation routine by prompting for information and configuring hardware automatically.

Windows Sound System 2.0 comes with a set of headphones and a customized microphone designed to allow Voice Pilot to work in noisy office environments. Microsoft also sells a $219 version of Sound System 2.0 that has a sound board.

—Michael Desmond



SOUND SCENE: Windows Sound System lets you attach sound files to your documents, as illustrated by the cassette icon above.

Caere Rejuvenates Its Leading OCR

Caere's OmniPage Professional 5.0 optical character recognition (OCR) software includes many technical improvements that make the product more accurate and easier to use.

OmniPage Professional uses several methods to boost the accuracy of its character recognition. The first, three-dimensional OCR, improves the ability to see subtle shades, contours, and spaces on documents —especially helpful for poor-quality faxed or photocopied documents.

OmniPage Professional also has tools for specific document types. The AnyFax feature works on faxes by disconnecting joined characters and reducing the jaggies. True Page Recognition lets users handle documents containing both images and text. And you have access to the full retail version of Caere's solid image editing package, Image Assistant.

Caere has replaced its menu-driven interface with an intuitive button-based one. The tool bar across the top of the screen includes buttons to automate the entire scanning/OCR process, access the settings panel, edit a document, open Image Assistant, and perform other common tasks. You'll also find buttons for adjusting the orientation of the document and for selecting processing zones.

OmniPage Professional is now TWAIN compliant, which means that it works with more popular scanners and has a WYSIWYG text editor. While the product doesn't have Object Linking and Embedding 2.0 support or offer the tight integration with Windows applications that's found in its biggest competitor, Calera Recognition Systems' WordScan Plus 2.0, we were quite pleased with OmniPage Professional's robust OCR engine and the product's greatly improved interface.

—Anita Hamilton

OmniPage Professional 5.0

WINDOWS **This product offers numerous improvements, including better recognition technology, tool bars for accessing common functions, and support for the TWAIN scanner interface.**
Caere Corp.
800/535-7226,
408/395-7000
List price: $695, upgrade $129 to $179
Reader service no. 649

WinSleuth Gold Plus Keeps Addin' On

WinSleuth Gold Plus

WINDOWS The latest diagnostic software makes it easier to add peripherals to your system.
Dariana Software Inc.
800/892-9950,
714/236-1380,
714/236-1390 (fax)
List price: through March $99.95, $189 thereafter
Reader service no. 633

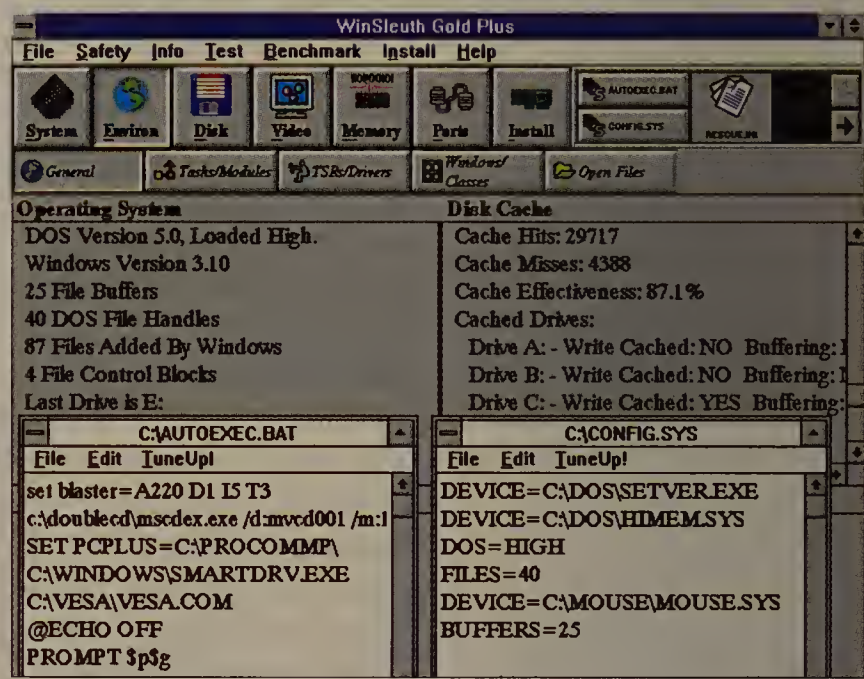
About three years ago Dariana Software launched the original Windows diagnostic and analysis program, WinSleuth. That was followed by major enhancements, WinSleuth Professional in 1991 and WinSleuth Gold in 1992. The latest incarnation, WinSleuth Gold Plus (introductory price $99.95), despite an annoying inconsistency, is another improvement on this handy software.

The latest WinSleuth offering makes it simpler to add peripherals such as CD ROM drives, sound boards, and LAN adapters. IRQ, DMA, and communication port data files are included for about 40 add-in cards that let you point and click configuration options during installation. You can also save your configurations and reload them when needed. This capability is very useful when you need to swap cards, because you don't have to figure out what parameters to use for the card when you're installing it.

The use of help balloons throughout WinSleuth Gold Plus is another much needed improvement. You can click a screen heading and receive a brief explanation of relevant technical terms. More useful additions include system statistical info, such as the number of cache hits, and performance testing for video, hard disk, and memory chips. If you suspect one of your memory chips is failing, you can work both conventional and extended memory chips for up to 24 hours at a time to identify the culprit.

We had one beef with the product—an apparent conflict in the reporting of DMAs and IRQs in use. The DMA/IRQ button correctly displayed one sound card's use of DMA1 and IRQ5. But when we went to the Direct Test screen and asked to test for available DMAs and IRQs, the screen indicated that DMA1 and IRQ5 were 'free'. Even with the sound card blaring the Battle Chess theme, the DMA/IRQ combination in question was shown to be available. Dariana claims that we uncovered a sound card reporting bug, which it expects to fix in the next upgrade. The upgrade will be free to registered users and will include some new features as well, the vendor says.

—Gene Smarte



WINSLEUTH GOLD PLUS makes it easy to look at, modify, test, and install hardware and software products in the Windows environment.

WinSense 2.0: Maximize Windows Performance

This $89.95 Windows utility lets nontechnical types optimize their PC's performance. And more sophisticated users will appreciate the product's INI file editor. WinSense 2.0 provides some aesthetic and practical improvements over version 1.2 that help you navigate and solve Windows problems faster. For example, you'll find better help boxes and new icons. There are also new tips on multitasking, memory, and fonts. But WinSense's three main features stay the same: the tune-up for optimizing the PC, dialog boxes that lead you through easy INI file editing, and backup features.

WinSense 2.0

WINDOWS This utility helps you optimize Windows INI files to improve your PC's performance.
SoftLogic Solutions
800/272-9900,
603/627-9900
List price: $89.95
Reader service no. 651

When you set up WinSense, the software performs an initial Windows tune-up. WinSense determines your hardware resources and asks questions about your work, such as what applications you use most. The program then suggests changes to the Windows INI files to improve performance.

For example, in a system short on memory, WinSense recommends a large disk cache for database users but a small one for word processor users. The program presents the tune-up recommendations in a list. For each recommendation, just click to see a detailed explanation of why WinSense would like to modify the INI file.

WinSense also lets you edit INI files on your own easily. Explanatory help screens are available with just a click. The software makes automatic backups for restoring INI settings. You can save and name backups, then easily compare them later. This feature lets you spot changes in INI files, such as those that happen when you install a new application. WinSense also has a large hypertext library of Windows information.

—Laurianne McLaughlin

(America Online)

(America Online is not really a pair of glasses, it is an online information service.)

Circle 107 on reader service card

It's in the Cards: New PCMCIA Modems From Xircom, Hayes

The latest in PCMCIA credit card–size modems include an innovative network/modem card from LAN adapter manufacturer Xircom and a 14.4-kilobits-per-second (kbps) speedster from market leader Hayes Microcomputer.

LAN/Fax-Modem Combo

Xircom's new CreditCard Ethernet+Modem is for notebook users who've found that the single PCMCIA slot found in many notebooks and subnotes doesn't provide enough room for their peripherals. This two-in-one product packs an ethernet LAN adapter and a 14.4-kbps fax-modem into a tiny PCMCIA Type II card. List priced at $699, it's also available as an external model, the Portable Ethernet+Modem, that connects to the parallel port. Xircom claims that an Ethernet+Modem costs 15 to 25 percent less than a separate LAN adapter and fax-modem.

One particularly nice feature of Xircom's Ethernet fax-modems is their concurrent LAN/modem access: You can send a fax or dial a BBS while remaining logged on to the network. Like all modems, Xircom's products support remote access software such as pcAnywhere, Carbon Copy, and CloseUp. And for ethernet LAN access, the Ethernet+Modems support data transfer rates of up to 10 megabits per second.

Because the Portable Ethernet+Modem connects to the parallel port, it leaves the serial port free for other external peripherals, such as a mouse or keypad. Also, because the parallel port (particularly the faster enhanced parallel ports found on today's notebook PCs) offers faster throughput than the serial port, the Portable Ethernet+Modem should transfer data faster than serial-based 14.4-kbps external modems, according to Xircom. However, we weren't able to verify this claim at press time.

The Portable Ethernet+Modem offers another innovative feature: the Phantom Power Cable. While this may sound like an otherworldly connector that hovers above your notebook, in reality it's a cable that runs from the Portable Ethernet+Modem to your notebook's mouse or keyboard port. The modem draws power from the notebook, thus eliminating the need for a separate battery pack. You can, however, plug the modem into an AC outlet if one is available.

While not everyone can justify the expense of an Ethernet+Modem, this LAN/fax-modem combo is handy for mobile professionals who use their portables both in the office and on the road.

ALL-IN-ONE MODEM AND LAN ADAPTER: Xircom's new Ethernet+Modems combine a 14.4-kbps modem and a 10-mbps LAN adapter into one small package.

HAYES DOES PCMCIA with its new Optima 144 + Fax144 modem, which costs $399.

Hayes Adopts PCMCIA

For many modem buyers, the name Hayes is synonymous with quality—and high prices. However, the company's new Optima 144 + Fax144 for PCMCIA fax-modem is priced comparably to its competitors. This $399 Type II modem sends and receives data and faxes at 14.4 kbps. And like Xircom's CreditCard Ethernet+Modem, the Optima 144 includes V.42bis data compression to yield a theoretical maximum throughput of 57.6 kbps.

The Optima comes with Hayes's Smartcom for Windows data and fax communications software. The product includes Hayes AutoSync, a feature that allows notebook users to communicate synchronously with mini- and mainframe computers back at the office.

Unfortunately, the Optima's bulky line adapter module (which connects the PCMCIA modem to the phone cable) is only slightly smaller than an external portable modem. This defeats many of the advantages of a credit card–size modem.

—Jeff Bertolucci

Xircom Ethernet+Modems

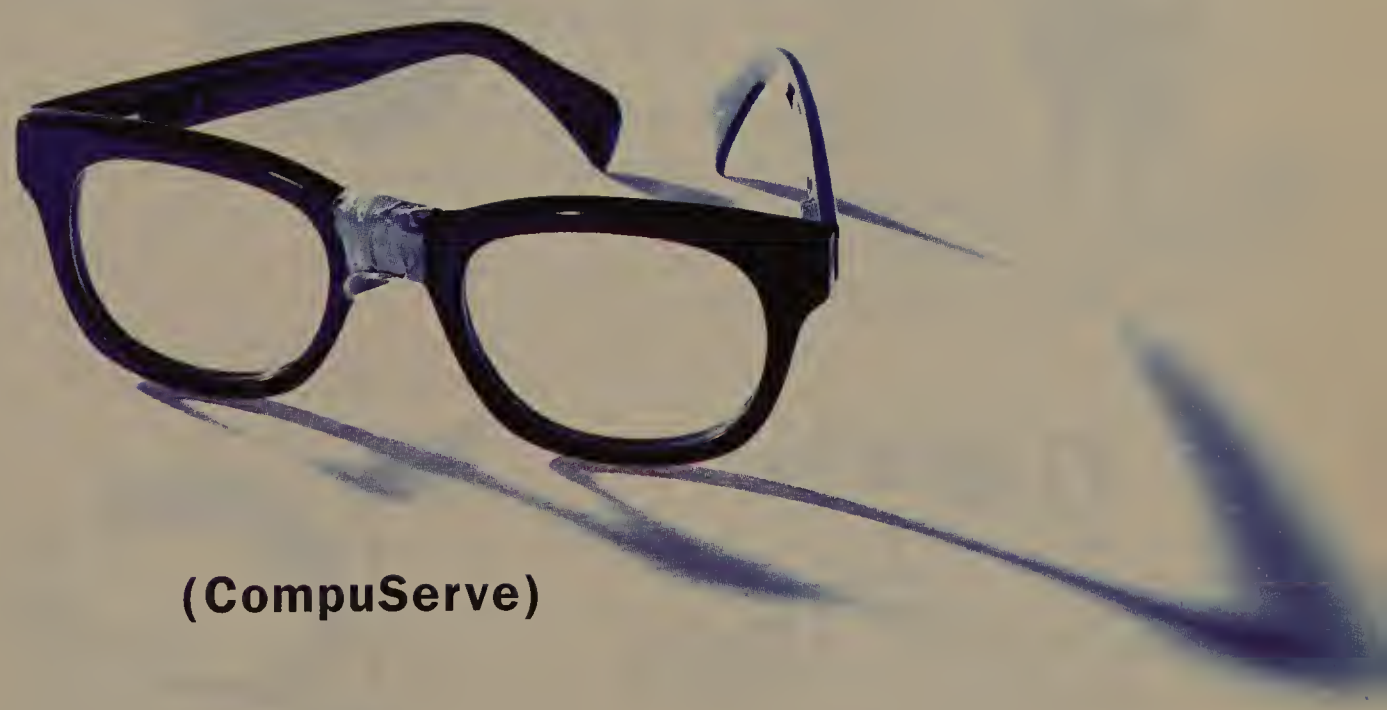
These combo LAN/fax-modem peripherals come in both PCMCIA and portable models.

Xircom Inc.
800/874-7875,
818/878-7600,
818/878-7630 (fax)
List price: $699
Reader service no. 616

Hayes Optima 144 + Fax144 for PCMCIA

A new credit card–size fax-modem that offers 14.4-kbps data and fax performance.

Hayes Microcomputer Products
404/441-1617
List price: $399
Reader service no. 617



(CompuServe)

(CompuServe is not really a pair of glasses, it is an online information service.)

Circle 107 on reader service card

What we're trying to say here is this is not your father's online service. This is GEnie.® And if you want to have some real fun, this is where you belong. Because no other online service has more cool stuff to do, or more cool people to do it with. And there's something new every day. So get on GEnie now. You won't believe your eyeballs.

Blah, blah. Blah. Blah, blah...

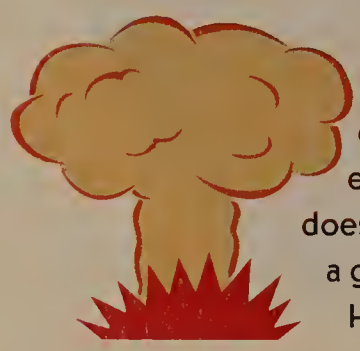
Gab, gossip, babble, ask, tell, question, answer, confirm, deny, agree, debate, scream, whisper, say something, say anything. GEnie chat. The one and only.

Explore strange new galaxies, seek out new life and new civilizations, or better yet, just hang out with people like you and talk about it. We've got RoundTables you'll actually care about. Science Fiction, comics, electronics, Mac, God, White House, motorcycles, MIDI, soaps. It's a cool world if you know the right people.

200,000 Files

Over 200,000 files to download. Games, graphics, sounds, text and then some. If that's not enough to keep you busy, you need to get out more.

(GEnie)

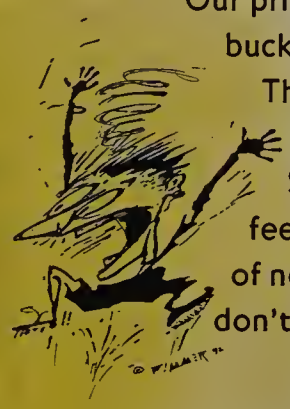


If you're having a problem with your computer, you can talk with one of our experts. And if that doesn't help, just give it a good swift kick. Hey, it could work.

Kick butt in CyberStrike,™ winner of *Computer Gaming World's* 1993 On-line Game of the Year Award. Want more butt-kicking? Try Air Warrior® or MultiPlayer BattleTech.™ Less butt-kicking? How about GemStone III,™ the fantasy role-playing adventure. No butt-kicking? Okay, we'll get back to you.

Cool offer

Join GEnie® Services now, and we'll give you credit against GEnie service charges in an amount up to whatever you spent on your competitive online service in the entire month of October 1993.* And if you can't bear to part with your old pals, they can come, too. Just tell them no pocket protectors. Incidentally, this offer will not be repeated. We want new customers. We don't want to go broke.



Our prices are insane! Only three bucks an hour in non-prime time. That's the lowest of all major online services. And the $8.95 monthly subscription fee includes up to four hours of non-prime time usage. Just don't blow it all the first night.

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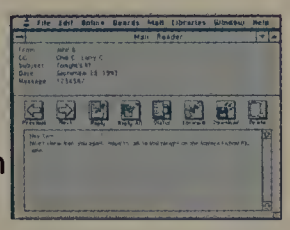

Tired? Lazy? Technologically inept? Have we got a deal for you. Call now and get a free GEnie front-end program with icons that are incredibly easy to use. Even if you have no clue what an icon is. There's one for Windows and one for Mac.** To get yours, either download once you're on-line, or call 1-800-638-9636 for a free disk.

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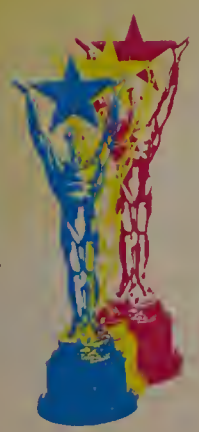
3. At the U#= prompt, enter JOINGENIE then press <RETURN>
4. At the key code prompt enter AAA222 to get this cool offer.
5. Have a major credit card ready. In the U.S., you may also use your checking account number. In Canada, Visa and MasterCard only.

*Some restrictions apply. Find out what they are before you sign up by calling or logging on to GEnie. Non-prime time is 6 p.m. to 8 a.m. local time Mon.-Fri., all day Sat. and Sun. and selected holidays. This offer is in lieu of all other offers, and is for new subscribers only. You don't have another service? Call us anyway.

** Minimum requirements: 386 and Windows 3.1, 4MB RAM. Mac Plus/Classic or higher, 4 MB RAM.

We've got the biggest big-name guests on-line. Actors, authors, politicians, computer gurus. Sorry, we can't name names. We'd have to deal with Legal. We hate that.



Circle 107 on reader service card

Automate CompuServe With Navigator for Windows

Looking for a way to save money on CompuServe? If you know your way around the service and check your favorite sections on a regular basis, CompuServe's new offline batch-oriented interface, Navigator for Windows, can dial you some savings.

Navigator for Windows (WinNav) minimizes the time you spend online by allowing you to set up sessions while you're offline. You can set up scripts to enter your favorite forums, retrieve messages, send messages, download and upload files, and post messages. Since forums are extended services, billed at $6 to $16 per hour (depending on the data transmission rate), it pays to be efficient. WinNav also lets you automatically send and receive messages on CompuServe Mail and retrieve information from basic services such as weather and stock quotes. Unfortunately, you can't retrieve Associated Press news or travel information with WinNav.

Learning the interface is a bit tricky. Although it employs Windows drag-and-drop and a tool bar across the top of the screen for common functions, the complexity of the interface's features can be confusing. Also, a script template would be useful, so that you could easily duplicate actions such as retrieving, marking, and reading new messages. Instead, Navigator for Windows forces you to set these actions manually for each forum.

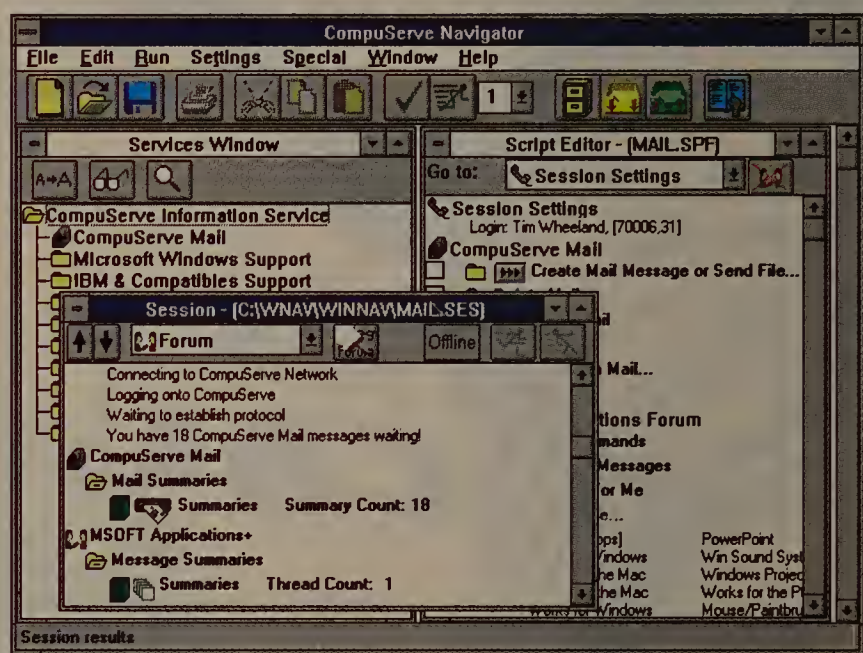
But all things considered, WinNav is a great time- and money saver for both power users and online riders alike.

—Anita Hamilton

CompuServe Navigator for Windows

WINDOWS **Create sessions offline to save time and money spent online.**

CompuServe
800/848-8199, 614/457-8600
Price: unavailable at press time
Reader service no. 619



WINNAV LETS YOU DRAG SERVICES FROM THE SERVICES WINDOW into the script editor and view your session's progress.

Group Scheduler Gets Drag-and-Drop, More Protocol Support

Arranging meetings for groups without running into scheduling conflicts can be a challenge. Fortunately, scheduling software has evolved to fill the needs of work groups, and the latest Network Scheduler 3, version 2, takes the genre a step further by adopting Windows conventions such as drag-and-drop and by supporting more message protocols.

Network Scheduler, like competing products such as On Technology's Meeting Maker and Campbell's OnTime, gives network and remote users access to a common public appointment calendar—as well as to individual calendars—making it easier to find mutually available free time, schedule meetings and reserve conference rooms, determine agendas, make changes, and even keep track of time-zone considerations. It also lets each individual keep personal time-management tasks private.

The latest version's enhanced interface lets you drag and drop appointments, meetings, notes, to-do lists, and other functions common to the group. You also can attach mail messages, detailed agendas, presentations, and spreadsheets, for example, to a scheduled meeting.

Network Scheduler now supports Lotus Notes and cc:Mail using Lotus's Vendor Independent Messaging (VIM) facility. Additional messaging systems now supported include MAPI (Microsoft Mail), X.400, and NetWare Global MHS. A single DOS/Windows version and a separate Mac version (in beta at press time) provide a similar functional interface across dissimilar environments. Network traffic is minimized because as users update or attach notes to a common calendar, the updates are grouped and sent as bundles. Network Scheduler runs on Novell, Microsoft, IBM, Banyan, LANtastic, and other popular networks.

If you're already using version 1.1 of Network Scheduler 3 or are looking for a comprehensive way to synchronize user and work-group scheduling, check out Network Scheduler 3 2.0. The beta version I tested had only one bug, an errant VIM file, which Powercore says is being addressed.

—Gene Smarte

Network Scheduler 3 version 2

WINDOWS **An improved interface and increased support for message protocols highlight this network calendar and scheduler.**

Powercore Inc.
800/237-4754, 815/468-3737, 815/468-3867 (fax)
List price: for 5 users $495, for 25 users $1995; site licenses available
Reader service no. 618

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Contura 4/25 Model 120 Features
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Circle 35 on reader service card

With Epson's 1-pass scanning, great images come easy.

Epson ActionScanning System

Epson's 1-pass system captures every detail and nuance of your image in one precise pass.

The Epson ActionScanning System. Everything you need in one box for under $1000.

Which scanner would you choose? All signs point to Epson's ActionScanning System for PCs. With 24-bit color, 8-bit grayscale and crisp 600 dpi resolution, it gives you picture perfect results in one simple pass. Precisely adjusting your image is easy, too, thanks to Epson's unique built-in controls. What's more, the ActionScanning System comes with

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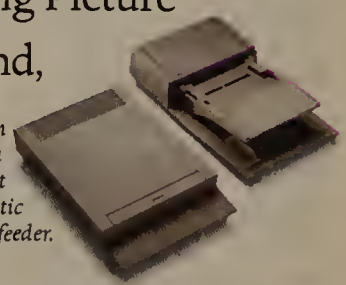
With Microtek's 3-pass scanning, image assembly is required.

Microtek ScanMaker II

Microtek's 3-pass process, as represented here, must scan your image three times, then assemble and align all three scans into one. (Images shown are not final output.)

everything you need to be a scanning expert right out of the box, including Picture Publisher 4.0 LE, one of the most versatile image editing programs around, as well as TextBridge OCR software. For a free booklet on scanning, or to learn more about the easy-to-use ActionScanning System, or our other scanners for PCs and Macintosh, or our full line of personal printers, call the Epson Connection at **1-800-BUY-EPSON** (800-289-3776). This is one scanner you should jump at the chance to own.



Useful Epson options include a transparency unit and automatic document feeder.

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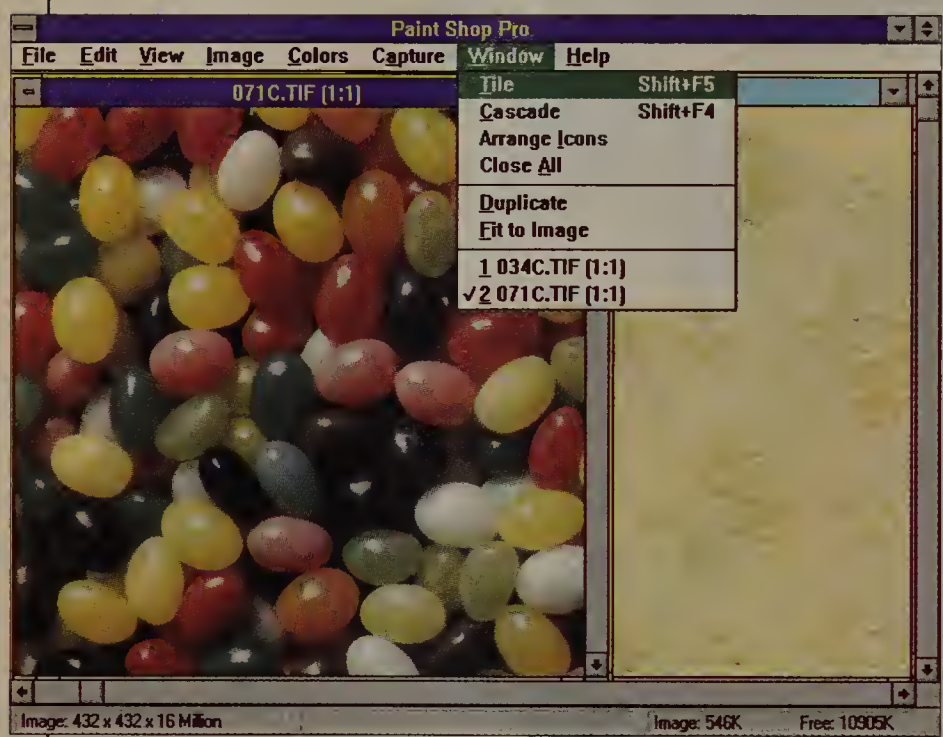
Edited by Jeff Bertolucci

Fax and Find

Caere's Fax and Find integrates Delrina's WinFax Pro 3.0 fax software with Caere's own Personal PageKeeper document management program. In addition to including the full retail versions of both products, Caere has created timesaving links between them. Once a fax is received by WinFax Pro, it automatically gets converted into a text file, compressed (up to 50:1), and indexed by keyword for easy retrieval by Personal PageKeeper. You can also send faxes directly from within Personal PageKeeper. Fax and Find lists for $249. Caere Corp., 800/535-7226.

Reader service no. 625



PAINT SHOP PRO 2.0, a $69 graphics utility, adds support for nine additional file formats, including Kodak Photo CD and JPEG.

Reply Video Accelerator Adapter

PS/2 owners can now score a low-cost video upgrade thanks to Reply's new Video Accelerator Adapter for Micro Channel. The add-in card features a Cirrus Logic GD-5426 accelerator chip and 1MB of DRAM to display up to 16.8 million colors at 640 by 480 resolution with an ergonomic 72-Hz refresh rate. The card's maximum resolution at 72-Hz refresh is 1024 by 768, displaying 256 colors. The Reply Video Accelerator Adapter comes with drivers for OS/2, Windows, Windows NT, and major applications. The product lists for $195. Reply Corp., 800/955-5295, 408/942-4804.

Reader service no. 628

Aspen Aura

Notebooks used to be rigid. Upgradability was a joke. But times have changed, and typical of the new flexible approach is Aspen Computer's Aspen Aura line. You can upgrade an Aspen Aura's processor from a 486DX-25 to a 486DX2-66 or any 486 CPU in between. Screens are upgradable too; you can go from monochrome to dual-scan passive color and, when available, to active-matrix color. You can even swap the trackball with a scanner interface. Additional modules include a fax-modem, a SCSI adapter, an ethernet adapter, a PCMCIA slot, and a second serial port for scanners. Prices start at $1795 for the 486SX-25 model with a monochrome screen, a 120MB removable hard drive, and 4MB of RAM and go up to $4195 for a 486DX2-66 with a passive color screen, a 200MB removable hard drive, and 20MB of RAM. Aspen Computer, 800/472-3273, 716/626-0315.

Reader service no. 620

Outside In for Windows 2.1

WINDOWS File viewing utilities can become out-of-date quickly. If one major application introduces an upgrade with a new file format, a file viewer that was compatible with everything suddenly isn't. Systems Compatibility has done a lot of catching up with Outside In for Windows 2.1. This latest version supports 13 new formats, including WordPerfect 6.0 for DOS and Windows, PKZip 2.*x*, Microsoft Word 6.0 for DOS, Quattro Pro for Windows, and the Paradox 4.0/Paradox for Windows format. In addition, the company has added OLE support—you can now view an object inside a file, and several of the word processor viewers have been improved to display tables within documents. The product lists for $89; upgrades are $29. Systems Compatibility, 800/333-1395, 312/329-0700, 312/670-0820 (fax).

Reader service no. 621

Paint Shop Pro 2.0

WINDOWS This file conversion, image editing, and screen capture utility now supports nine more file formats (including JPEG and Kodak Photo CD), TWAIN-compliant scanners, and batch file conversion. It's fast and does some basic editing. For instance, simply click a menu selection to add a border to an image or to adjust brightness and contrast. If you need to convert a large number of files from one format to another, a single menu choice will take care of it. Even the Windows screen capture utility has been improved. To activate a full-screen capture, just click the right mouse button. While Paint Shop Pro 2.0 won't do batch printing or fancy editing, it's all many casual graphics dabblers will need. This $69 program fits on a single 3½-inch floppy disk. Jasc Inc., 612/930-9171, 612/930-9172 (fax).

Reader service no. 623

Courier V.32terbo Modems

The speed limit has been raised again on the data comm highway. U.S. Robotics has introduced seven new modems with the V.32terbo protocol, which transfers files at an uncompressed rate of 19.2 kilobits per second (kbps). All the models include a passel of features such as call selection, which automatically routes incoming data and fax calls; call-back security; and synchronous dial-in for connecting to mainframes. The base models offer data-only transmission, the middle-of-the-line products provide 14.4-kbps Class 2.0 fax, and the top-of-the-line models include U.S. Robotics' 21.6-kbps proprietary protocol along with fax and V.32terbo. Prices range from $645 to $1295. The PS/2 model, which includes fax, is $745. U.S. Robotics, 800/342-5877, 800/982-5151, 708/982-5151.

Reader service no. 622

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PowerViewer

It's 9:00, Monday morning and you've just learned the horrifying news. That big meeting with the president of the company next week? It's been moved up. Way, way up. And that report for the big meeting? It's due in half an hour. Fortunately, you've got PowerViewer™ for Windows™, the one tool that lets you access virtually any database and create presentation-ready reports with a few simple clicks of the mouse. You take a long sip of coffee, sit down in front of your computer and click open PowerViewer.

Access More Information.

Click. Quickly, you access the Connect Profile menu and select the database you want. Because PowerViewer supports over 25 of the most popular PC and relational databases, all the information you need is right at your fingertips. And with Powersoft's Database Connection Hotline, you know any questions you have will receive immediate answers. Click. You go into the Report Painter and select the specific data for your report using one of PowerViewer's powerful point-and-click query techniques. You choose the one that suits you best, whether it's our easy-to-use QuickSelect, our powerful graphical query builder, or a query you've saved from a previous task. Click. Now you're ready to create your report. You select one of the many built-in QuickStyle

Create Stunning Reports.

templates that enable you to create stunning reports with full-color 2D and 3D graphs and charts. PowerGuides and Data Smart design tools lead you through every step and let you preview and customize any aspect of your report in seconds. Include a pie chart. Change fonts. Add colors. Pull in your corporate logo. And click, click, click — suddenly, you've created a masterpiece. PowerViewer makes information access as simple as point and click. It empowers you to make full use of your company's information and lets you do it faster and with greater ease than you ever thought possible.

PowerViewer, Just $49.

It's 11:00 and you've just come out of the big meeting. Your report was a hit. A big hit. So big, in fact, the president has asked you to run it by the entire company, gather everyone's opinions and give him a report on your findings. Under ordinary circumstances, this would be the kind of news that could ruin your entire month. Fortunately, one of your colleagues has PowerMaker™ for Windows, the tool that gives you all the functionality of PowerViewer plus the power to design fully-interactive forms, manipulate databases and create complete Windows-based applications in no time.

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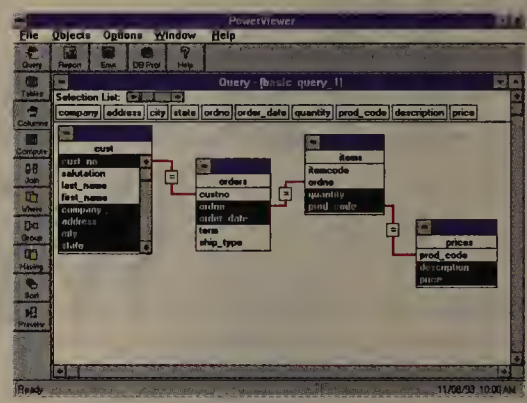

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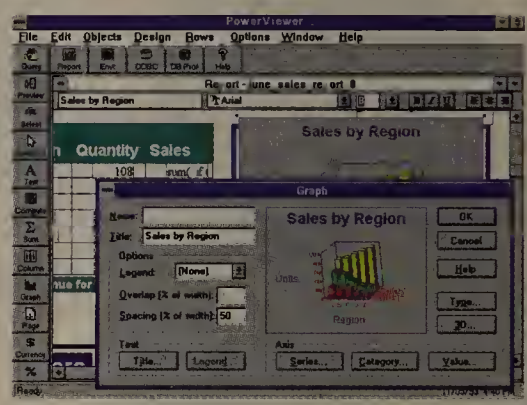

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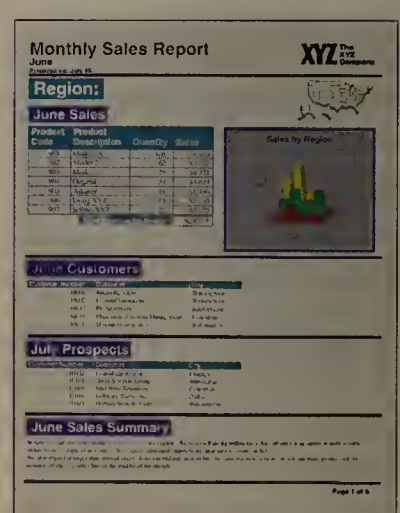

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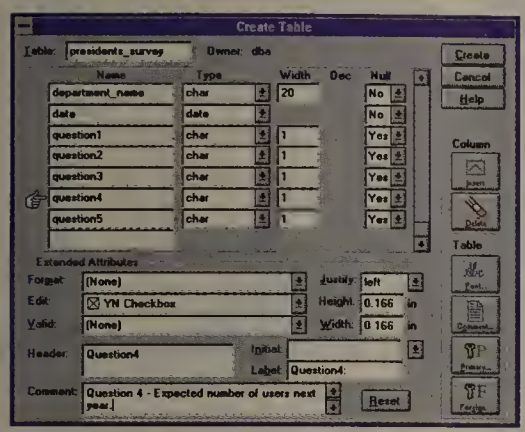

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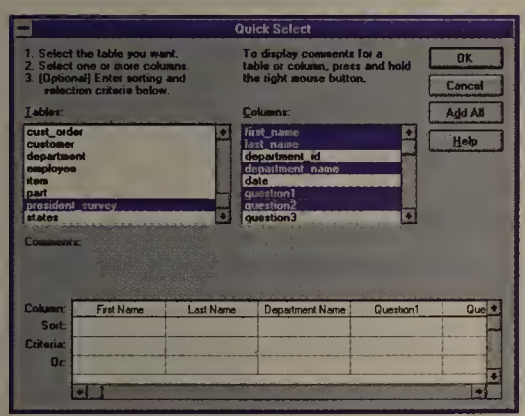

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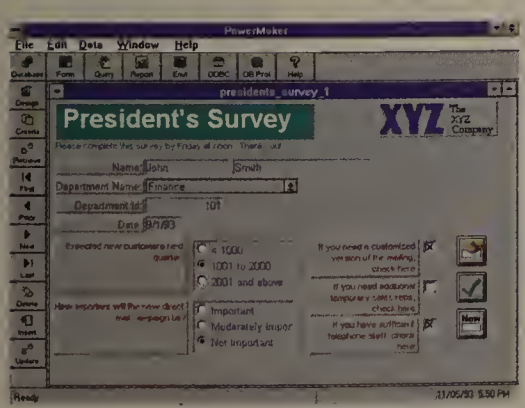

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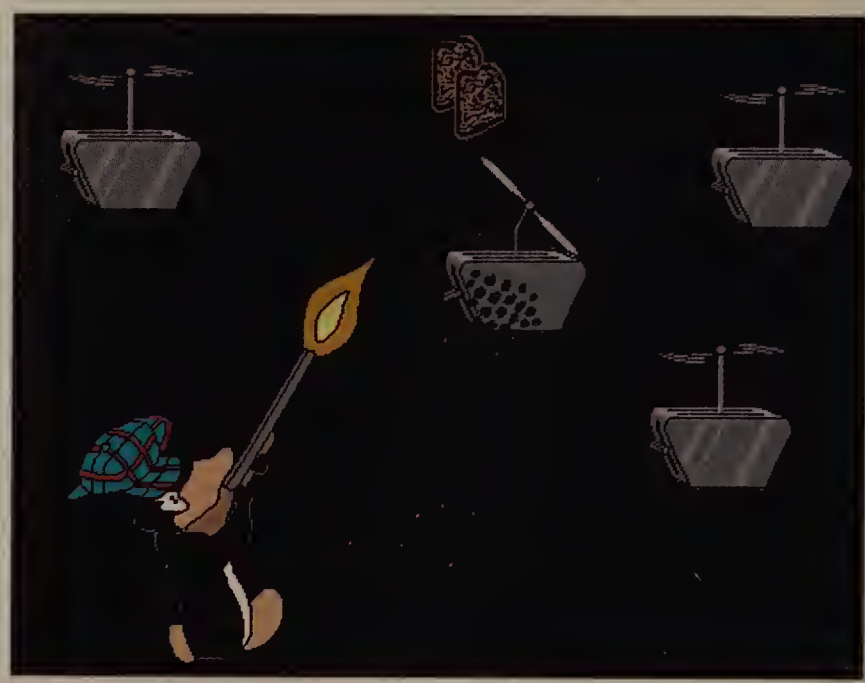
pansion slot and packs 105MB of storage on a 10.5mm card. The PocketFile is designed as a secondary drive for today's notebooks (which typically have internal hard drives) or as a primary storage device for the next generation of subnotebook and hand-held PCs. It offers 15ms access time, which is comparable to that of today's desktop hard drives. The PocketFile is bundled with a protective carrying case and retails for $750. Intégral Peripherals, 303/449-8009, 303/449-8089 (fax).

Reader service no. 632

The Far Side Daily Planner, Intermission 4.0, and the Opus 'n Bill Screen Saver

WINDOWS Delrina seems committed to putting fun into computing, and judging from three new programs, they're doing it with an attitude. The Far Side Daily Planner is an update of the Far Side Calendar, with a new set of cartoons and a few practical improvements. These include an address book, text search, and the capability to import and export text. Not so practical are the new sound effects and Monday cartoons in color. Delrina has also bought ICOM Simulations' Intermission screen saver. Intermission 4.0 offers a morphing utility, 3-D ray-traced animations, interactive games, and disco dancing pigs. Delrina's strangest new entry is the Opus 'n Bill Screen Saver, based on Berkeley Breathed's *Bloom County* and *Outland* comic strips. In 16 screen-blanking animations, Opus the Penguin and Bill the Cat shoot at helicopter toasters, swim in fishbowls, and ponder the most important thing in life, which can't be published in this magazine. The Far Side Daily Planner lists for $59.95, Intermission 4.0 for $39.95, and Opus 'n Bill for $44.95. Delrina, 800/268-6082, 206/823-0568 (fax).

Reader service no. 627



OUTLAND-ISH BEHAVIOR: In the Opus 'n Bill Screen Saver, Opus the Penguin shoots down propeller-driven toasters.

SmartPrint Starter Kit

If your office has two PCs and a printer, you probably need a low-cost printer sharing system rather than a full-blown peer-to-peer network. SmartPrint is an inexpensive way to connect as many as 32 computers and printers. The Starter Kit includes two computer modules, one printer module, a power supply, and two 25-foot lengths of wire with standard modular phone (RJ-11) plugs. The package offers a 500-kbps data transfer rate and works with all Windows applications, according to the vendor. The SmartPrint Starter Kit costs $199. Dresselhaus Computer Products, 909/945-5600, 909/989-2436 (fax).

Reader service no. 631

Memory Commander 4.0

Memory Commander 4.0 has a new help system that the company claims is the most extensive of any memory manager. You don't have to remember to optimize Memory Commander after adding new drivers or RAM-resident programs; it detects these changes and asks you if it should reoptimize. Memory Commander also retains its main claim to fame: It increases your conventional RAM beyond what its competitors can do. It can turn your lower 640K into as much as 920K, improving performance for large, text-based DOS apps. You can't run Windows or other graphics programs when using this configuration, but Memory Commander can automatically switch to a less expansive mode when you want to go graphic. It lists for $99.95. V Communications, 408/296-4224, 408/296-4441 (fax).

Reader service no. 626

WinBook 486SX

If you need a light, affordable 486 notebook, consider Micro Electronics' new WinBook. Sporting an energy-saving Intel SL-enhanced 25-MHz 486SX processor and weighing only 5.4 pounds, the WinBook incorporates the PicoPower Evergreen HV chip set. This chip set integrates battery and power management and extends the life of the nickel–metal-hydride battery. (An optional second battery is available for $79.95.) This sleek-looking note comes with 4MB of RAM expandable to 32MB and a 200MB or 340MB hard drive. It includes a convenient on-board trackball centered below the keyboard and has a 10-inch backlit monochrome display. The WinBook also incorporates a 9600/2400-bps internal fax-modem and a Type II PCMCIA slot. It costs $1699; a dual-scan color model is $2399. Micro Electronics, 800/468-2162.

Reader service no. 624

Picture Prowler

WINDOWS If you work with lots of graphics files, you know how difficult keeping track of all those images can be. Xing Technology's Picture Prowler can save time and aggravation by helping you manage image files. This Windows-based program compresses images in industry-standard JPEG format, lets you assign keywords to files, and groups files under topics. Picture Prowler also provides thumbnail views for quick access to images. It gives you control over final image quality, letting you crunch images to 1/10, 1/20, or even 1/100 their original size. Picture Prowler imports TIFF, BMP, and GIF files and can export native JPEG files to those formats as well. Picture Prowler lists for $49.95. Xing Technology Corp., 800/294-6448, 805/473-0147 (fax).

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LOTUS

GET THE MOST FROM 1-2-3 & THE LOTUS APPLICATION SUITE

You Can Look It Up

No one outside Lotus understands why 1-2-3 release 4.0 ships without a handy reference to all @functions and macro commands. Lotus realizes this is a problem and may fix it soon. In the meantime, Senior Associate Editor Richard Cranford has written a clever macro that prints the @functions and macro commands for you (see *Q&A*).

We're trying to make the information in our own back issues more accessible as well, with an index of all *PC World Lotus Edition* material from December 1992 to December 1993. We've put this into a standard ASCII text file and put it on PC World Online on CompuServe and America Online (in the same libraries where you find each month's models).

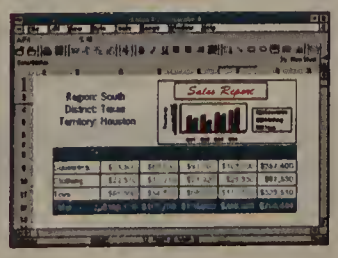
Have any suggestions to improve the index? Drop me a line at 77 Franklin St. #300, Boston, MA 02110; 617/426-0235 (fax); America Online (EBENDER); or CompuServe (71154,443).

Eric Bender, Executive Editor

50 Tips for the Windows Suite

L4 Lotus Development has enhanced every component of SmartSuite and the company's allied communications packages during the past year. Here's the latest advice on getting the most from the newest versions of 1-2-3, Improv, Ami Pro, Freelance Graphics, Notes, cc:Mail, Organizer, and Approach.

Start the Year Right With 1-2-3 Organizers **L15** Okay, 1994 will be different—*if* you're willing to do a little work to get your life in order. These models will help you balance your checkbook, plan your diet, create a budget, and remember key dates.



News **L2** Lotus wants Notes to become a container for storing and sharing documents created by 1-2-3 and other Windows applications. And readers sound off about the lack of printed documentation for 1-2-3 release 4.0.

Improving Your Skills
L20 Add Special Characters to Your Worksheet

Macro Basics
L22 Sampling Release 4.0 Macros

Advanced Macros
L25 Utility Macros Save Time

Q&A
L27 List @Functions and Macro Commands

Suite Success
L30 A Smart Install for SmartSuite

Improvisation
L33 Tricks for Importing 1-2-3 Data

COMING IN FEBRUARY

- What You Need to Know About Notes
- Solving Problems With Data Tables

See page L19 for information about ordering Models on Disk, which includes models and other files from these articles.

Lotus News

NEWS YOU CAN USE ABOUT THE LOTUS APPLICATION SUITE

Notes Aids 'Working Together'

Sometime this year Lotus will begin selling more of Notes than of its former mainstay, 1-2-3 for DOS. And the pioneering work-group application environment already holds center stage in Lotus's Working Together strategy as a container for documents created by other packages such as 1-2-3, Freelance Graphics, and Ami Pro.

The Working Together blueprint implies three levels of integration, says Lotus Chief Technology Officer John Landry.

The first, integration among core desktop applications, is achieved in the SmartSuite through shared functionality and common user interface elements such as the live status bar, SmartIcons, and common menus.

Lotus plans to enhance the Suite's synergy by including Lotus Script (a common scripting language that's based on Microsoft's Visual Basic) and by bringing functions such as charting into shared modules. Also, you can expect Improv's Infobox command palette to make an appearance in other Lotus Windows applications.

And like other software vendors, Lotus will add support for the major new release of Windows expected later this year, with its revamped user interface and interapplication links based on the new Object Linking and Embedding (OLE) 2.0 standard.

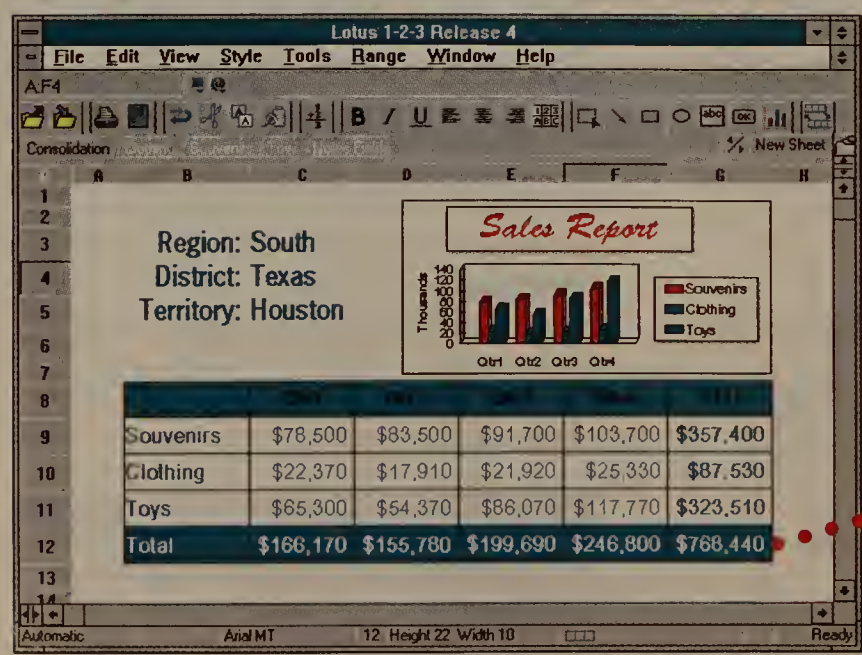
Acting as a document container, Notes will make it easier to track and share worksheets and other documents.

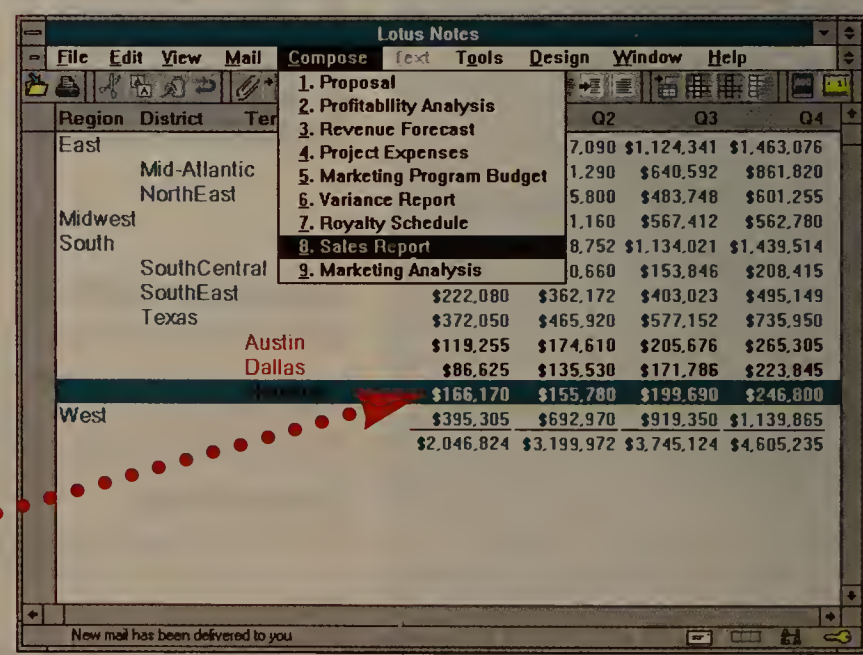
Notes Integrates 1-2-3 and Other Applications

The second level of integration is currently accomplished via Notes Field Exchange (FX). Based on the OLE 1.0 standard, the FX technology makes Notes a document container for a variety of "editors": 1-2-3, Ami Pro, Freelance, and others.

For example, you can embed a 1-2-3 worksheet in a Notes document and, by specifying common fields, share information between the two applications. Thus, the embedded object inherits the capabilities of Notes. You can categorize the object, search it, and view it based on information in these common fields, and you can share the object efficiently with other users. Notes also exploits OLE technology to make it possible for you to embed sound, images, and video into a document and view these with Lotus Sound or other editors.

On the third level of integration, Notes integrates more people and more resources into the work group. It achieves this by accommodating diverse platforms, traditional computing systems, and remote users. Notes currently runs on OS/2 and Windows servers as well as on OS/2, Windows, and Macintosh clients. Additionally, UNIX and Windows NT servers and clients are expected early this year.





NOTES NOW OFFERS NEW WAYS TO MANAGE DOCUMENTS created by 1-2-3 and other applications. The 1-2-3 worksheet, left, is embedded in a Notes database, right. Data such as sales totals automatically flows from 1-2-3 into Notes, where it can be viewed easily by co-workers.

This broad support is key for most organizations, which typically run numerous applications on several major platforms. In contrast to archrival Microsoft, which is building a work-group application strategy around a future version of Windows, Lotus believes "it should not be necessary to get rid of everything you've got just to implement a strategic [work-group] system," Landry says.

Adding Work-Group Tools

Within the next two years, Lotus plans to introduce more tools to enhance Notes. Among them is Lotus Forms, a work-flow application that gives Lotus an answer to products from Delrina, WordPerfect, and other vendors. Lotus Forms will let you design electronic forms that feature familiar tools like the status bar, then easily route them over Notes or cc:Mail.

Another enhancement is Notebook, a development tool for creating snazzier user interfaces and importing data from traditional databases, which should arrive early this year.

ScreenCam, a multimedia application that's still in development, will let you create a "movie" (complete with sound) of a 1-2-3 work session, for example, then distribute that movie over Notes to explain your worksheet or teach a co-worker some tricks.

And soon you'll be able to enhance the work flow in your organization by programming an electronic Lotus Agent to initiate activities for you. For instance, you could program an Agent to check your mail database for messages marked 'Urgent' and forward them to your electronic pager. These and other amenities, says Lotus president Jim Manzi, will make the Notes desktop "the place where people live on the network." **—Ann Kremers**

LETTERS

We've been deluged with letters about the need for more detailed printed documentation for new Lotus packages. A sampling:

Documentation Should Provide Context

I have been involved for several years in spreadsheet template development, working almost entirely in the DOS environment and only starting to use Windows this year. The first Windows software that I purchased was Improv 2.0, and I have recently purchased 1-2-3 release 4.0.

As you can imagine, I have had a lot of catching up to do. These products differ substantially from their DOS cousins, especially in the macro languages. But neither contains more than superfluous printed documentation on programming. As I began using the online documentation, it became clear it was written for those who know exactly what they're looking for and is meant merely to refresh the user's memory or clarify points of syntax.

I find it impossible to use the online help as a learning tool because I can't grasp the full picture from such a limited resource. If Lotus and other developers won't give template designers the tools to build efficient, well-thought-out templates to enhance their products, we won't be able to help them in selling more of those products.

A compromise is to do what my template distributor (Village Software) and compiler manufacturer (Baler Software) do: Include ASCII text files of manuals so users can make their own hard copies.
Patrick J. Tierney, Quebec

Put It in Writing

Lotus has done an excellent job putting the 1-2-3 release 4.0 documentation online, but I still prefer reading a manual, and I am shocked that Lotus did not provide a printed reference for macros and @functions as they have always done in the past.

Forcing everyone to use online documentation is wrong. Lotus should at least offer those of us who need manuals the option of purchasing the documentation at a reasonable cost.

I'm 100 percent behind Lotus and its vision for computing. I hope Lotus is equally committed to serving its customers. Don't burn the books!
Jeffrey Yockers, Allentown, Pennsylvania

DOS Help Is Better

Online help might usefully replace some of the manuals, but only if it's easy to use, clear, and concise.

1-2-3 3.4 and Magellan have fast, convenient online help. In its Windows products, Lotus unfortunately adopted Microsoft's horrible help system, which is not only slow but extremely difficult to use. If Lotus can bring its own superior DOS help systems into its Windows products, then maybe the manuals won't be necessary.
Bob Shoring, via Internet

Shorter Documentation Is Just Right

I feel the new streamlined documentation is right-on. I have used microcomputers in my dental practice since 1980. I remember when I had to do all the programming myself. Then came the time when others wrote the programs (with bugs but no documentation). This period was followed by programs that were advertised as having voluminous documentation (too much of a good thing). Now the programs are great, and the streamlined documentation is enough.
Kenneth Manuelian, Natick, Massachusetts

SmartSuite Needs Manuals for Release 4.0

I recently ordered and received SmartSuite 2.0. I examined and tested the programs for ten days and then returned the package. The principal reason: the lack of manuals for 1-2-3 4.0.

If release 4.0 were only an upgrade, I could accept the argument for not furnishing manuals. But as you know, this program is totally different [from 1.*x*] and contains numerous new features. Lotus should at least offer additional manuals at a nominal cost!
Robert Berns, Plymouth, Indiana

Mail your reactions, responses, and ideas to Letters, PC World Lotus Edition, *77 Franklin St. #300, Boston, MA 02110, or send them electronically via fax (617/426-0235), MCI Mail (583-1797), or to EBENDER on PC World Online on America Online or on CompuServe. Include your name, city, state, and phone number. We reserve the right to edit letters.*

Time is money
If you want to know
if he loves you
So, it's in
his kiss.
Neither a borrower
nor a lender be.
To thine own
self be true.
Chicago Daily Tribune
THE BUCK
STOPS HERE
Alan E. Cober

Here's the latest advice for tapping the power of the Lotus application family.

50 Tips *for the* Windows Suite

YOU'VE ALREADY HEARD much of life's best advice many times: *Neither a borrower nor a lender be. To thine own self be true. If you can't stand the heat, get out of the kitchen. Time is money. If you want to know if he loves you so, it's in his kiss.*

But you haven't heard most of the best advice for Lotus's impressive Windows suite of applications, since every last one of them has been upgraded or introduced during the past year. So here are the best tips we've found for getting the most out of 1-2-3, Improv, Ami Pro, Freelance, Notes, cc:Mail, Organizer, and Approach.

1-2-3 release 4.0 for Windows

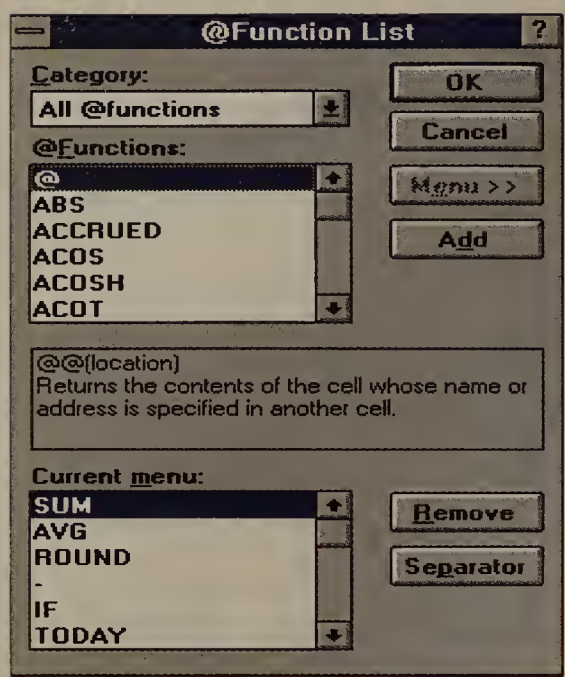
1 Create @functions without typing. Release 4.0's @function selector can save you a lot of keystrokes by typing @functions for you. To see how it works, start in a new worksheet and click the @function selector, the button with an at sign (@) right above the SmartIcons. A list of @functions drops down.

If the function you want isn't on the list, you can access one of the other 200-plus functions by clicking *List All*. For now, though, click the word *IF*. 1-2-3 types the formula @IF(condition;x;y), switches to Edit mode, and highlights the first argument in the formula.

Since the cell pointer is already in place, begin typing to replace the dummy argument *condition* with a valid true/false expression. Type **@MONTH(@NOW)<6**. Double-click the letter *x* and type **"First Half of Year"**. Then double-click the lowercase *y* before the close parenthesis and type **"Second Half of Year"**. Don't delete the semicolons that separate the arguments. Press **<Enter>** or click the *Confirm* button (the green check mark to the left of the contents box). This creates a formula that returns either 'First Half of Year' or 'Second Half of Year'.

2 Customize the @function list. As you identify the functions you use most, add them to the drop-down list. Click the @function selector, then click *List All*. In the dialog box, click the *Menu* button to display the Current Menu list. To take a function out of this list, select it and click *Remove*. The dots in the list are separators.

ALAN E. COBER



1-2-3 @FUNCTIONS ON THE CURRENT MENU will appear on the @function drop-down list.

To add a separator, select the function you want the separator to follow and click *Separator*. To add a function, select the function in the Current Menu list that will precede the new one, then select the new function in the @Functions List at the top of the dialog box and click *Add*. Optionally, you can select one of the @function categories from the Category drop-down list before selecting the function to add.

Continue adding and removing functions until the menu of @functions includes those you use most. Then click *OK*.

3 Delete locally. Have you ever used the Delete•Rows command to get rid of rows from a table, only to find that you've also lost some badly needed rows from another table? You can guard against this if you delete with the Delete Selection option.

Set up a simple worksheet to try this. Enter **Thursday** in cell A1 and **January** in cell C1. Select range A1..A7, then hold the **<Ctrl>** key and drag the mouse over range C1..C12. Select *Range•Fill by Example* to fill the two ranges with the days of the week and the months. Assume that these are the beginnings of two tables of data.

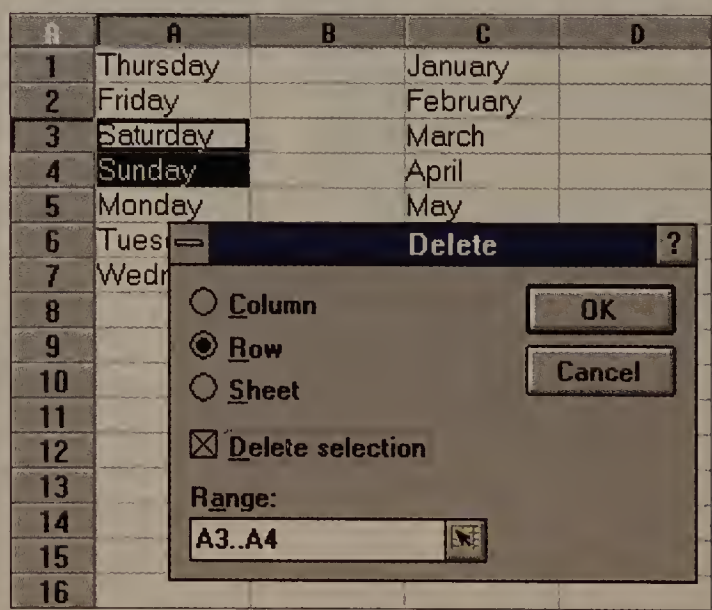
Now suppose that you only want to use weekdays in the left-hand table. If you select range A3..A4, choose *Edit•Delete*, leave the *Rows* button checked, and click *OK*, you'll remove the labels Saturday and Sunday from the left-hand table, but you'll also remove the labels March and April from the right-hand table. In previous releases, the only way to avoid this was to move range A5..A7 to cell A3. In release 4.0, you can delete rows but restrict the deletion to the columns of the selected range.

Select range A3..A4, then choose *Edit•Delete* (or hold down the **<Ctrl>** key and press the **<Gray Minus>** key, the one next to the numeric pad). Leave the *Row* radio button checked, but click the *Delete Selection* check box. Then click *OK*. This deletes rows 5 and 6 from column A. The labels Monday, Tuesday, and Wednesday move up by two cells. Any other entries below row 6 in column A would also have moved up two cells. Other columns, including column C and its list of months, are unaffected.

Delete Selection also works when deleting columns. For example, you can move everything in rows 15 to 24 to the right of column C one column to the left without affecting data above row 15 or below row 24: Select range C15..C24, select *Edit•Delete*, click the *Column* button, click *Delete Selection*, and click *OK*.

4 Select an appropriate SmartIcon palette. Release 4.0 comes with eight palettes that reflect the tasks involved in different kinds of spreadsheet work. For example, the Macro Building palette contains the icons you need when developing macro applications—icons that let you run macros, turn step mode or keystroke recording on or off, or run the Dialog Editor or Macro Translator utilities. The Working Together palette helps you when you're setting up connections between a worksheet and documents made by other applications.

To select a SmartIcon palette, select *Tools•SmartIcons* and choose from the drop-down list of palettes. A quicker way to select a palette is to click the *SmartIcons* button on the right side of the status bar (the one with three blue squares) and choose from the pop-up list.



RESTRICT DELETIONS to a specified range by selecting the Delete Selection check box.

5 Insert locally. You can also insert rows and columns locally. Select a range that includes the columns you want to restrict the insertion to, starts where you want to insert the rows or columns, and contains as many rows or columns as you want to insert. Then select *Edit•Insert* (or hold down **<Ctrl>** and press **<Gray Plus>**), select the *Column* or *Row* button, click *Insert Selection*, and click *OK*.

Macro writers will appreciate the ability to insert rows without corrupting other parts of the worksheet. Sometimes, when programming on the fly, you realize a macro needs a new instruction between two existing ones. Select a range that includes the column where you entered the macro names and the column where you entered the macro code itself, then follow the previous instructions to open up one or more new rows without adding empty rows to tables elsewhere in the worksheet.

6 Move data with the mouse. Drag-and-drop moving may be the easiest way to rearrange a 1-2-3 worksheet. It's especially useful now that there's no menu command for moving worksheet entries.

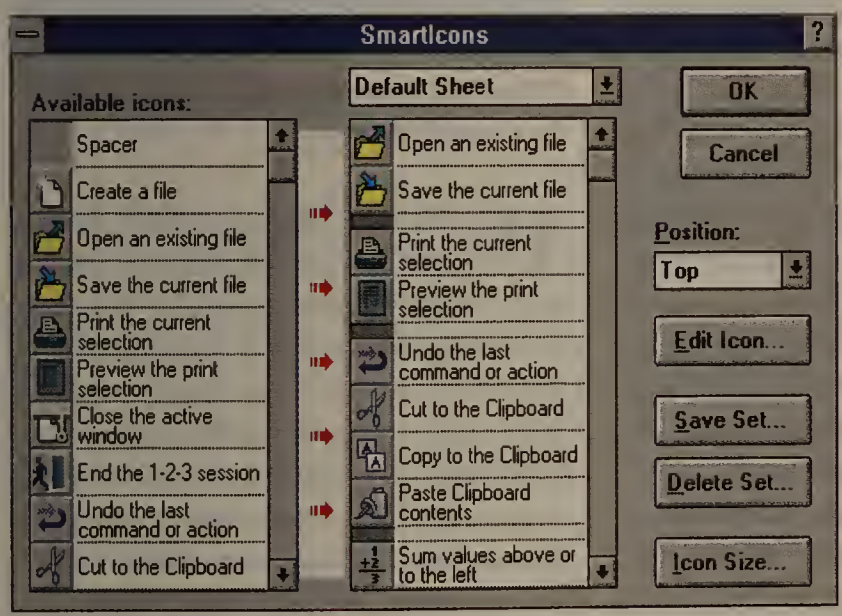
To move a range, highlight it with the mouse, then carefully position the mouse pointer at one edge of the range until it changes from an arrow to a hand. Press and hold the mouse button; the hand closes and a dashed outline appears around the range. Move the mouse and the dashed outline moves with it. Move the line until its upper left corner lines up with the upper left cell of the desired new location, then release the button. The data jumps to its new home.

7 Make your own SmartIcon palette. As with the @function selector, you can identify the SmartIcons you use most and make your own palette. Here's how to do it.

Select *Tools•SmartIcons* to open the SmartIcons dialog box. On the left are all the available

icons. On the right are the ones in a particular palette, indicated on the drop-down list above the palette. Click the down arrow in the drop-down list and select the palette that comes closest to containing the icons you'll use most. Click the *Save Set* button, and type a palette name in the Name of Set box and a file name in the File Name box of the resulting dialog box. Click *OK*.

To populate your new palette, just drag icons from the Available Icons set to your set. To remove an icon, drag it to any location outside of the right-hand list. Rearrange your set by dragging icons to new positions. To create spaces between icons, drag the Spacer tile from the top of the Available Icons set so that it covers the icon you want it to precede. When you have the icons you want in your new palette, click *OK*. This palette becomes the current one.



CREATE A PALETTE that includes the SmartIcons you use most.

8 Print wide ranges. Suppose you've just produced a report using 161 worksheet rows. Printing the report on one page is out of the question, so you select *File•Page Setup* and create a footer that includes the page number, click *OK*, then select *File•Print*, click the current worksheet button, and click *OK*. As the first pages appear, you realize that the print range is not only dozens of rows too tall for a page, it's a column too wide. The first several pages omit the rightmost column, which is then printed on separate pages.

One solution to this problem is compressed printing. But what reduction factor do you use? In all earlier releases of 1-2-3 that support compressed printing, choosing Automatic Reduction is not a good idea, because that would be asking the software to fit the entire range on one page!

Release 4.0 is more flexible. Sure, it can reduce a large worksheet enough to fit it on one page, but it can also reduce a range just enough so its columns fit on a page even if several pages are needed to print all the rows.

To use this feature, select *File•Page Setup* (or select *File•Print* and click the *Page Setup* button). Open the Size drop-down list and select *Fit columns to page*. Click *OK*.

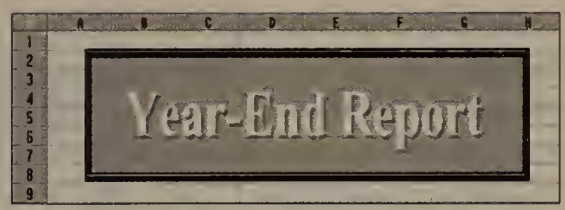
9 Protect charts from changes in the worksheet. Creating a chart in release 4.0 is easy: Highlight the range you want to graph, select *Tools•Chart* or click the chart icon, and click where you want the upper left corner of a default-size chart to appear or drag the mouse to create a custom-size chart.

Charts in release 4.0, unlike those in earlier releases, don't occupy a range of worksheet cells; instead, they "float" in front of the worksheet. This means that you can adjust the chart's size exactly as you want it.

Be aware, though, that inserting or deleting rows or columns, or changing column widths or row heights, can affect the size and aspect ratio of a chart. For example, if the upper left corner of a chart is in cell B8 and the lower right corner is in cell F21, adding a new column between columns C and D will make the chart substantially wider.

To insulate the chart from such changes to the worksheet behind it, detach its lower right corner from the worksheet. With the chart selected, select *Edit•Arrange•Fasten to Cells*, click *Top left cell only*, and click *OK*.

10 Create dramatic shadow effects with text boxes. You can relieve a worksheet's facts-and-figures tedium with eye-catching graphical objects. The figure in this tip shows a title for a financial report worksheet. If you've tried out 1-2-3's drawing features, you probably recognize it as a text box with a gray background and a designer frame. But how is the shadow effect created? The answer lies in using two text boxes. Here's how to recreate the Year-End Report box in the figure above.



CREATE A SHADOW EFFECT around a worksheet heading by creating two text boxes.

First, select *Tools•Draw•Text* and draw a frame from cell A2 to cell H8. Type **Year-End Report**. Then select *Style•Font & Attributes* from the menu bar. Select *Times* from the list of typefaces, select *48* from the list of sizes, click the *Bold* check box, and click *OK*. Select *Style•Alignment*, click *Center*, and click *OK*. Select *Style•Lines & Color*, set the background color to light gray (open the Background Color palette and click the second square from the right in the top row), set the text color to dark gray (the rightmost square in the top row of the Text Color palette), and click *OK*.

With the text box still selected, press **<Insert>** to create an exact duplicate. Select *Style•Lines & Color*, open the Pattern palette and click the square with the T (for transparent), open the Line Style palette and click the word *None*, then open the Text color palette and click the white square. Click *OK*.

You now see white text superimposed on the gray-on-gray text you created earlier. Reposition the white text a bit higher and to the left of the gray text. To do this, move the mouse pointer to a thick part of one of the white letters, hold the button, and move the mouse a little bit. The second text box's bounding box appears; move the mouse until its upper left corner is just above and to the left of the corner of the gray box, and release the mouse button.

Click a worksheet cell to deselect the second text box. Reselect the first box: Put the mouse pointer below the gray rectangle and move it up slowly until it turns into a vertical bar. Select *Style•Lines & Color*, open the Designer Frames palette, click the next-to-last square on the bottom row, and click *OK*.

Improv for Windows

11 Use views to change formatting. Improv views enable you to do more than rearrange data. When adding formatting to your worksheet, you can create

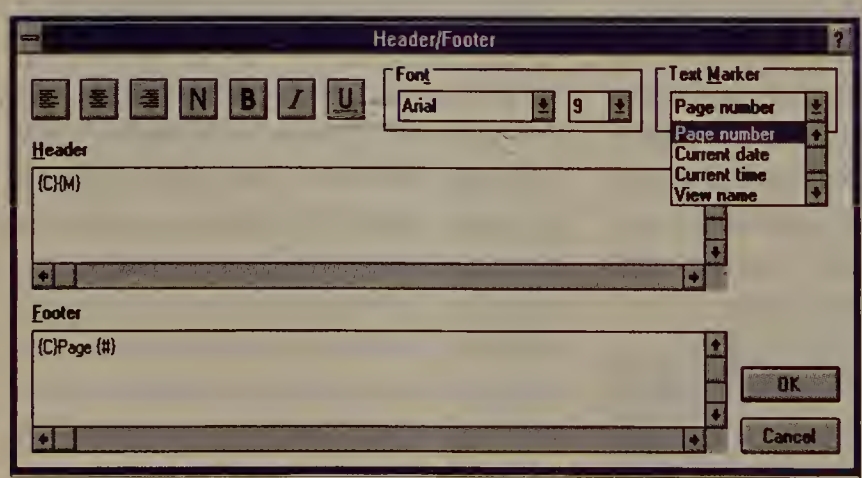
a new view instead of changing your original. By turning off the Apply Styles to All Views option in the InfoBox, you can create as many as 16 stylistic versions of one worksheet, each featuring its own colors, fonts, fills, and numeric formats.

12 Create models from templates. If you find yourself creating many models of the same basic type, save time by creating a template. For example, if you generally create models with two views plus a Presentation view and a Hotview, create a template with these characteristics.

Select *Tools•User Setup,* click the *Paths* button, and enter a model name in the Startup Model box. All Improv models created thereafter will inherit the Startup Model attributes, including formulas, scripts, views, and presentations.

13 Explore your printing options. If you're used to working with a conventional spreadsheet, you may not realize how many printing options are available in Improv. Take time to explore the Page Setup dialog box.

In the Content box at the top left, you can tell Improv to print the data pane and the formula pane on separate pages, or to print them both on the same page. In the layout box, you can tell Improv where to place item labels on multipage reports, and whether to number pages from left to right or from top to bottom. The Margins box has two options 1-2-3 doesn't have: Center vertically and Center horizontally.



IMPROV HAS MORE HEADER AND FOOTER options than 1-2-3 does.

Click the *Header/Footer* button in the Page Setup dialog box, and you'll see that Improv gives you many more options for these elements. You can put the page number, date, time, view name, worksheet name, model name, file name, and total number of pages in the header or footer by selecting options from the Text Marker drop-down box. You can also align the contents of the Header and Footer boxes and select different text styles, fonts, and font sizes. You can enter your name, your company name, or anything else you want in these boxes. And you can have multiple-line headers and footers. If you don't specify a header or footer, Improv uses its defaults, centering the model name in the header and the page number in the footer.

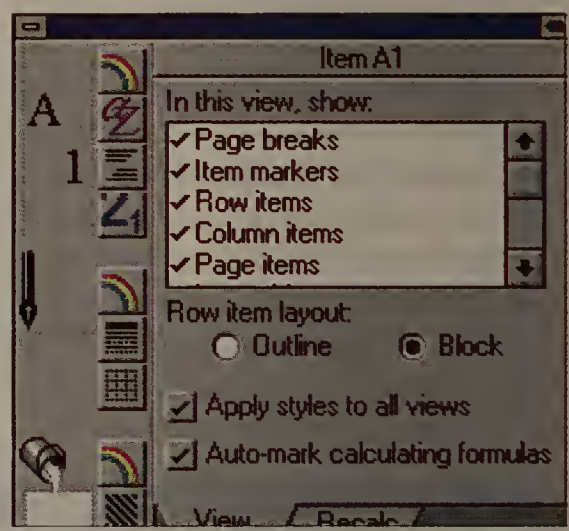
14 Be selective about your style. To change the fonts, fills, or colors used on item names without changing the attributes assigned to the cells in the worksheet, use the Edit•Select Item Names command before you select a new style. This technique enables you to enhance worksheets quickly before printing.

15 Make formulas more readable. Improv's English-like formulas are much easier to decipher than traditional spreadsheet formulas. You can make Improv formulas even more readable by inserting spaces between arguments and controlling line breaks. Improv will automatically wrap any formulas that exceed the width of the screen, but you can change the way that formulas wrap by inserting a return character at any point with the key combination **<Ctrl>-<Enter>**.

16 Reopen closed windows. When you close a worksheet, script, view, or presentation window without closing the underlying model, the model is not deleted from the worksheet. You can reopen it by selecting its grayed icon from the Browser.

17 Hide items that you don't want to graph. To plot a noncontiguous range of data, first hide the intervening items by selecting each of the items and using the *Worksheet•Hide Items* command or pressing the **<Ctrl>-H** key combination. Then highlight the ranges that you want to chart, and select *Create•Chart.*

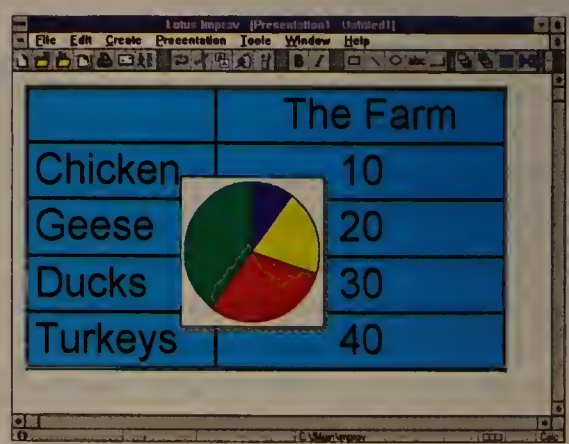
18 Keep the InfoBox open. Click the *InfoBox* button on the status bar and keep it open so you can change fonts, formats, and other worksheet settings on the fly. If the InfoBox is in the way, you can move it by clicking the top of the box and dragging it.



THE INFOBOX displays styles and formats for the current selection.

19 Discover the Color Cells SmartIcon. Select *Tools•SmartIcons* and bring the Color Cells SmartIcon over into an icon group. When you click on this icon, Improv presents you with a dialog box, where you can specify the conditions under which you want cells to be colored. For example, you can tell Improv to color the text for all amounts less than zero either red, blue, black, yellow, cyan, or magenta. Color cells can slow down processing, however, so remove the check from the All Cells on Recalc box and apply color only when you want to.

20 Add Hotviews of worksheet data to presentations. In 1-2-3, you add your chart to the worksheet and print both together. In Improv, you create a presenta-



COMBINE LIVE WORKSHEET DATA with a chart by creating a Hotview.

tion window to contain both your charts and a Hotview of your worksheet data. For example, after you create a chart, go back to the worksheet and select *Create Hotview*, then select the name of the presentation that you just created. Improv will combine the selected data with the chart on one page.

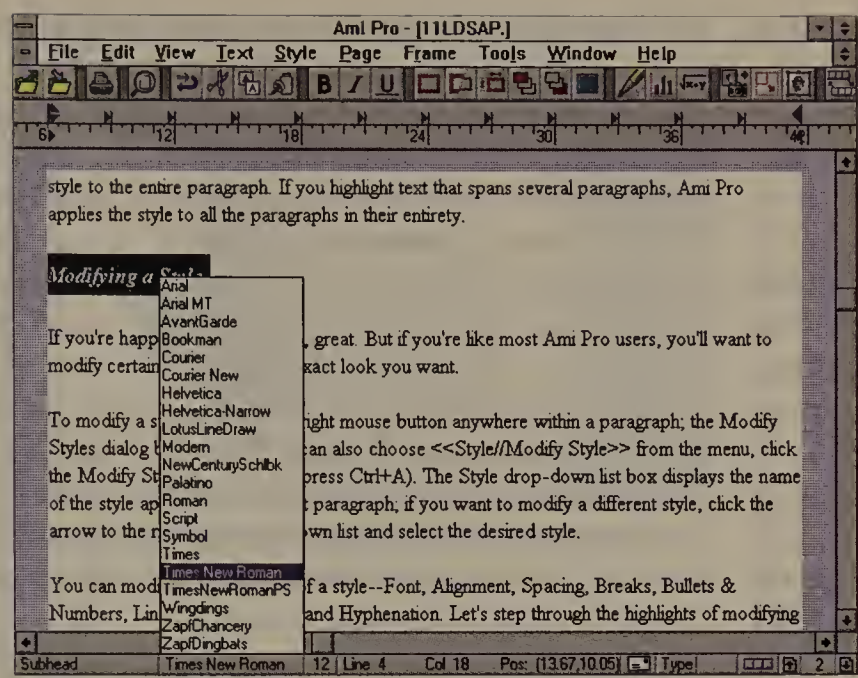
Ami Pro

21 Use Ami Pro's existing style sheets. Ami Pro comes with over 50 predesigned templates for all types of business documents. When you select *File•New* to create a new document, Ami Pro presents a dialog box with a list of these templates plus any that you may have created. Select one, click the *With Contents* box, then click the *Preview* box to preview the style sheet.

22 Select an appropriate SmartIcon palette. Ami Pro comes with the following SmartIcon palettes: Default, Editing, Graphics, Long Documents, Macro Goodies, Proofing, Tables, and Working Together. You'll work faster if you display the palette appropriate to the task at hand. For example, if you're creating a business form, you'll want to display the Tables palette.

To select an existing SmartIcon palette, click the *SmartIcon* button and select a palette from the pop-up list. Or select *Tools•SmartIcons*, and in the resulting dialog box click the drop-down box at the top of the middle column, select a palette, and click *OK*. The palette you selected will appear at the top of the screen.

23 Make your own SmartIcon palette. You can create your own SmartIcon palette. Select *Tools•SmartIcons*, and select a set that contains many icons you want. To add icons to this set, drag the icons from the Available icons list to the middle column of icons. To delete an icon, drag it outside of the middle list. When you've finished modifying the icon set, click the *Save Set* button and assign a new name to this icon set and a new name to the file. When you click the *SmartIcon* button on the status bar, your new icon set appears as a selection.



CLICK THE FACE BUTTON on Ami Pro's status bar to change fonts.

24 Use the status bar for quick changes. Along the bottom of the document window, you'll see a bar with several buttons. This is Ami Pro's live status bar. Each button on the status bar provides a shortcut to a common Ami Pro command or function, or information about the current document.

The Style Status button on the far left displays the current paragraph style. To change the style, click the button and choose from the pop-up list. To change the font of selected text, click the *Face* and *Point Size* buttons (the next two buttons on the status bar), and select from the lists.

Click the *Document Path* button, in the middle of the status bar, to switch between various types of information. Click it once, and it displays the current date and time. Click it a second time, and it displays the line, column, and position of your cursor. Click it again, and it goes back to displaying the path name of the current document.

The Mail Notification button appears only if you have received mail from cc:Mail for Windows or Lotus Notes while in Ami Pro. The Typing Mode button displays one of three modes: Insert, Typeover, and Revision Marking. Click the button to switch between these modes.

The Caps Lock button displays 'Caps' if you've pressed the <Caps Lock> key. Otherwise, the button is blank.

The button with the three blue boxes is the SmartIcons button. Click the button when you want to display a different SmartIcon palette or when you want to hide or show the SmartIcons.

The two Page Arrow buttons let you move quickly to the next or previous page (when you're in Layout mode) or to the next or previous screen (when you're in Draft mode). Between the Page Arrow buttons is the Page Status button. When you're in Layout mode, this button displays the current page number. When you click the Page Status button, the Go To dialog box appears, letting you move quickly to a specific page.

25 Click the right mouse button for help. If you can't remember what a particular SmartIcon does, don't bother to reach for your Ami Pro manual. Click the right mouse button instead. Ami Pro displays the description of the SmartIcon in the title bar at the top of the Ami Pro window.

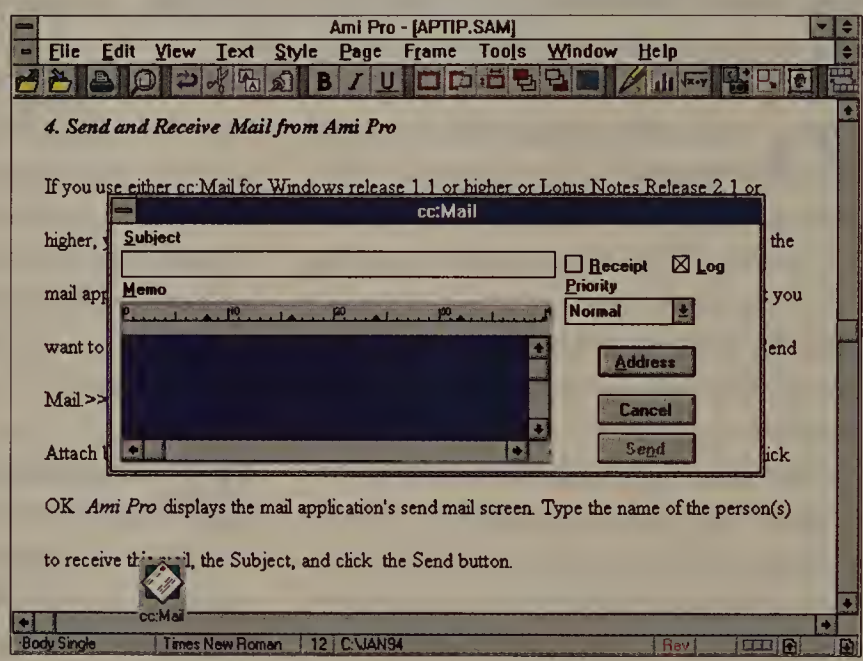
26 Drag and drop for quick copies and moves. If you're using Ami Pro release 3.0 or higher, there's no need to use the Edit•Cut or Edit•Paste commands to move text from one section of your document to another. With drag-and-drop text editing, you eliminate the step to the Clipboard. You just select the text you want to move, click on it, drag it to its new position, then release the mouse button. When you begin to drag the selected text, you'll notice that the cursor changes to a vertical bar with an arrow and a pair of scissors (similar to the Cut to the Clipboard SmartIcon).

To copy text, select the text you want to copy, hold down the **<Ctrl>** key and press the mouse button, drag the text to its second location, and release the mouse button. This time the cursor changes to a vertical bar with an arrow and two blocks (similar to the Copy to Clipboard SmartIcon).

27 Let Ami Pro proof your documents. Even though you may have won your fourth grade spelling bee, it's easy to miss typos. Ami Pro 3.1 incorporates Houghton Mifflin's unabridged spelling checker and CorrecText grammar checker. You'll find these options by selecting *Tools•Spell Check* and *Tools•Grammar*

Check. The spelling checker includes special word lists for legal, financial, and scientific writing. The grammar checker can be set to business, legal, technical, casual, and several other writing styles.

28 Send and receive mail from Ami Pro. If you use either cc:Mail for Windows release 1.1 (or a later version) or Lotus Notes release 2.1 (or a later version), you can send and receive messages within Ami Pro. To do this, first make sure that the mail application is loaded into memory (only one please), then make the Ami Pro document you want to attach to a message the active window (or select the desired text). Select *File•Send Mail.* A dialog box appears with the option to attach the desired SAM file. Click on the *Attach* box (this option is grayed out if you've chosen to send only a block of text), then click *OK.* Ami Pro displays the mail application's send mail screen. Type the name of the recipient and the subject, and click the *Send* button.



WHEN YOU SELECT FILE • SEND MAIL, Ami Pro asks if you want to attach the current file, then launches you into your mail application.

If your mail application is loaded, Ami Pro can notify you when you receive mail. The Mail Notification button in the status bar lets you know when you've received mail from either cc:Mail for Windows or Lotus Notes. Click on it to display your mail application's receive mail screen.

Freelance Graphics for Windows

29 Customize the Freelance startup. You can get to work quicker by changing the way Freelance starts. If you want to start your Freelance sessions with a blank presentation page rather than the welcome screens, choose *Tools•User Setup,* select *Skip the standard dialogs and bring up a blank page,* and click *OK.* The next time you start Freelance, you'll see a blank page in an untitled presentation.

If you'd rather not see the welcome screens or an untitled presentation, change Freelance's file properties in the Windows Program Manager. Exit from Freelance and switch to the Program Manager. Select the *Freelance* icon and *File•Properties* (or press **<Alt>-<Enter>**). At the end of the command line entry, press the **<Space>** bar and type **/Q**. For example, if your Freelance program files are located in the C:\FLW directory, the command line should read C:\FLW\FLW.EXE /Q. Click *OK* and restart Freelance. To open an existing presentation, select *File•Open* or click the *File Open* SmartIcon. To create a new presentation, select *File•New* or click the *File New* SmartIcon.

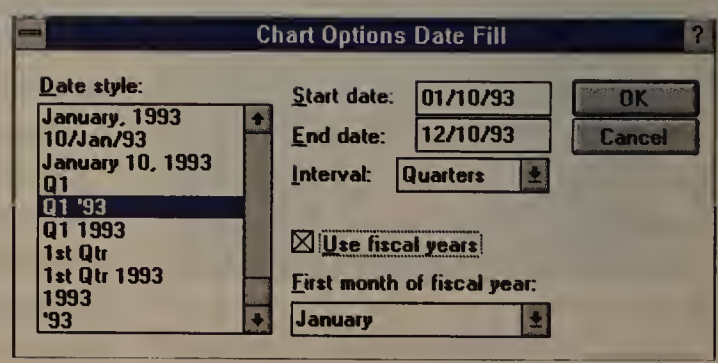
You can even set up Freelance so that it opens a particular presentation file each time you start the program. In the Program Manager, select the *Freelance* icon and choose *File•Properties* (or press **<Alt>-<Enter>**). Replace the command line entry C:\FLW\FLW.EXE with the name and path of the Freelance presentation file: for example, C:\FLW\WORK\YREND.PRE. Click *OK* and then double-click the *Freelance* icon. Subsequently, when you start Freelance, it automatically opens the presentation file.

If you'd like to start your Freelance work session in Outliner mode or Page Sorter view rather than the Current Page view, select *Tools•User Setup,* select *Page sorter* or *Outliner,* and click *OK.* The next time that you start Freelance, it will default to the display mode you specified.

30 Import noncontiguous ranges. You can import two or more ranges of data from 1-2-3 or any other spreadsheet into a chart as one data range. To do this, select *Chart•New•Data Chart,* select a chart type, and click *OK.* In the Chart Data & Titles dialog box, click the *Import* button and specify the worksheet that contains the data you want to import. Highlight the first range of data to be imported and click *OK.* Freelance will present a dialog box telling you that you haven't selected any data. Click *OK.* The data you've highlighted is copied to the Clipboard, and the Chart Data & Titles dialog box reappears. Then you can move the pointer to the appropriate cell and select *Edit•Paste* to paste the data or select *Edit•Paste Link* to paste the data and establish a link. Continue with these steps until you've imported all of your worksheet data.

31 Generate date labels quickly. The Data•Fill command in 1-2-3 (Range•Fill in release 4.0) is a quick way to create a range of labels. Freelance Graphics has a similar (but little-known) command: Chart•Options•Date Fill. With this command, you can generate a series of dates for use as text data, axis labels, and legends quickly and easily.

To try it, open the Chart Data & Titles window, position the pointer in the axis labels or legends area, and choose *Chart•Options•Date Fill.* (If the cursor is not in the axis labels column or the legend row, Freelance will beep.) Complete the Chart Options Date Fill dialog box to specify the date format and range of dates you want to generate. First, select a format from the Date Style list box. Next, fill in the Start Date and End Date text boxes (by default, the Start Date is today's date). Click the down arrow in the Interval drop-down box to select an interval for the date labels (such as days, weekdays, months, or years). Select



FREELANCE LETS YOU GENERATE A SERIES OF DATES quickly and effortlessly with Options • Date Fill.

the *Use Fiscal Years* check box if your fiscal year is different from the calendar year, then choose the first month of the fiscal year in the list box. Finally, click *OK* to generate the labels.

32 Run Freelance screen shows from the Windows Program Manager. Run your screen shows right from an icon in the Windows Program Manager instead of Freelance. In the Program Manager, select *File•New*, select *Program Item*, and click *OK*.

Enter a description of the screen show in the Description field, and in the Command Line field, enter a command such as the following one:

C:\FLW\FLW.EXE /S C:\FLW\WRK\FILENAME.PRE

Replace the term C:\FLW\FLW.EXE with the directory where your Freelance program files are located. Replace the term C:\FLW\WRK\FILENAME.PRE with the drive, directory, and name of your presentation file.

Select *Run Minimized* and click *OK*. When you're ready to roll, just double-click the icon from the Program Manager. When Freelance starts, open the presentation file and begin the screen show. If you're using Freelance/W release 2.01, when the screen show is complete, the program will shut down and you'll be returned to the Program Manager. If you're using release 2.0, Freelance will remain open and you'll have to exit from it manually.

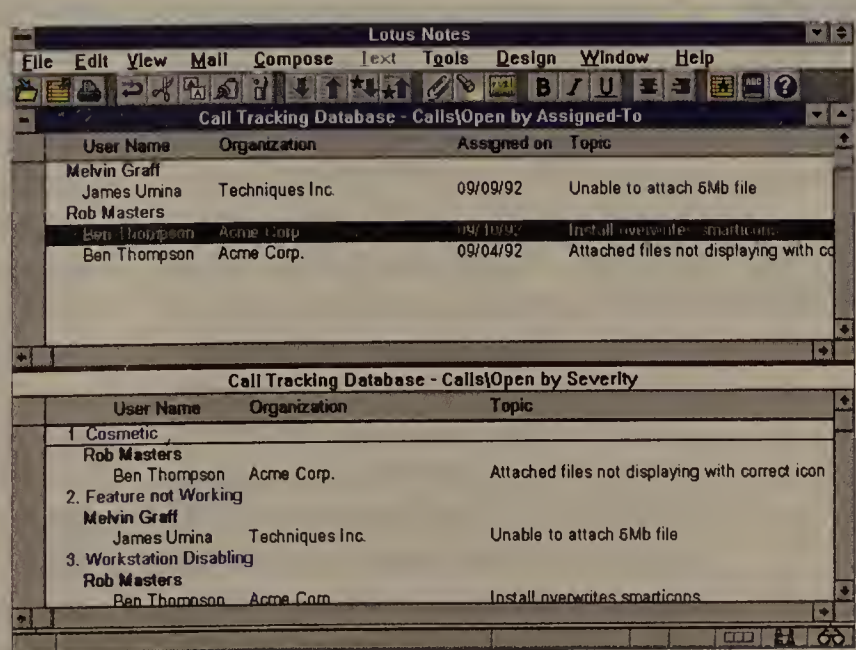
33 Change text in a grouped object. In Freelance for Windows 2.*x*, you can edit text in a grouped object without ungrouping the object first. Let's say, for instance, you create a rectangle and then add a text block on top of it, maybe as part of a diagram. You then group the two objects with the *Arrange•Group* command so that you can easily move or size the objects together.

If you later need to change the text, just click the grouped object twice (don't double-click). You'll see a blinking cursor, and the text will be surrounded by a rectangle, but you won't see the usual text ruler. Now you can add or delete text.

CHANGE THE TEXT IN A GROUPED OBJECT by first double-clicking the text portion of the object.

You can use this same trick to edit text elements in charts, such as axis labels and titles, headings, notes, and legend labels. For example, to change an *x*-axis label in a bar chart, click twice slowly on the axis label, then change the text. The change is reflected in the Chart Data & Titles window.

34 Move objects with the keyboard. When your drawings need to be pixel perfect, use the cursor keys instead of the mouse. You can move objects much more precisely with the keyboard. Select the object you want to move, and then press the appropriate cursor key (<Up>, <Down>, <Left>, or <Right>) to move the object a single pixel at a time.



DISPLAY TWO VIEWS OF YOUR NOTES DATABASE at once. Here a call tracking database displays calls grouped by technician. The lower view shows the same calls ranked by the severity of the problem.

You can also use the keyboard to size an object. First click the object. The eight selection handles that appear around the object indicate that it has been selected. Press the period key. You should see a plus sign on the top-left selection handle. (You can move the plus sign around the selection handles by pressing the period key again.) Then press a cursor key to size the object in the specified direction, one pixel at a time.

Notes 3.0

35 Categorize your documents. Add more order to Notes views by sorting your documents into groups, or categories. To categorize your documents, select a document from the current view or open a document and choose *Tools•Categorize*. In the Categorize dialog box select the category you want to use. If you want to assign the selected document to more than one category, select each category name. When you've finished selecting categories, click *OK*.

You can also define new categories. To create a category called North, for example, choose *Tools•Categorize*, enter **North** in the New Categories text box, and click *OK*.

Not all views allow categories, so if you want to view your documents in their respective categories, you'll have to select a view that displays categorized documents.

36 Display two views at once. If you need to see two different views of the documents in a database, open two windows. Open the database and select a view from the View menu. Then select *Window•Workspace* and open the database again. Select a different view from the View menu. Finally, choose *Window•Tile* to display the document windows one on top of the other. Choose *Windows•Cascade* to arrange the documents and the Notes desktop in a diagonal stack. You can switch among the views by pressing **<Ctrl>-<F6>** or clicking the mouse anywhere within the window.

37 Look before you click. To see the action a button will perform before you activate it, hold down the **<Ctrl>** key

before you click it. Notes displays the Insert Button dialog box, which shows you the macro formulas used to create the button and what the button will do.

38 Bypass menus and dialog boxes when saving documents. If you're composing many documents and are tired of saving the current document and then going to the Compose menu to create another document, here's a quick solution. When you finish composing a document in a nonmail database, press the **<Ctrl>-<Shift>-<Enter>** keys to save the current document and display a new blank document form. (In a mail database, <Ctrl>-<Shift>-<Enter> mails the document but doesn't save it.)

When you finish composing documents, press **<Esc>** or double-click the right mouse button to display the Document Save dialog box. Select *Save* if you want to save a copy for yourself. Otherwise, click *OK* to save the document.

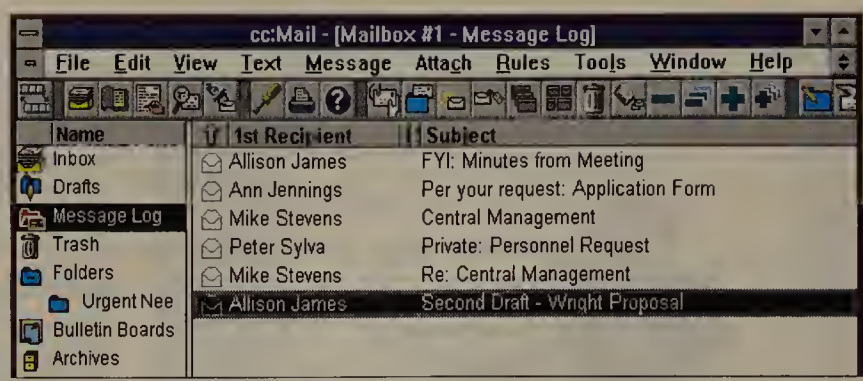
cc:Mail for Windows 2.0

39 Show the icon name. If you need help distinguishing one SmartIcon from the next, display the name of each icon underneath the icon itself. Choose *Tools • SmartIcons*, click *Icon Size*, select *Large with Text*, and click *OK* twice. cc:Mail displays an enlarged SmartIcon palette that shows the name of each icon.

ANNOTATE YOUR CC:MAIL ICONS.

40 Customize displays. If the amount of information displayed in a cc:Mail folder is distracting, get rid of the data you don't need and display only what's important. For example, if you'd rather see more information in the Author and Subject columns and can do without the Date and Size columns, enlarge the first two columns and shrink the latter two so that they're no longer visible.

First, use the mouse to shrink the size of the columns you don't need. (Note that you cannot resize columns or window panes without a mouse.) Move the pointer directly over the slider for the Date column (the thin vertical line that appears between the headings 'Date' and 'Size'), and click and drag the slider to resize the column. Drag it to the left to make the column smaller; drag it to the right to make the column larger. When you release the mouse button, cc:Mail redisplays the columnar data. To remove a column from the display, just drag the slider to the left until the information in that column is no longer visible. You may have to size the columns a few times before you get it right.



HIDE DATA YOU DON'T NEED in a cc:Mail display by resizing columns.

Once you've resized the columns, you need to save the new window settings. Click the *Control* menu box just to the left of the menu bar or press the **<Alt>** key and the **<Hyphen>** key simultaneously. Select *Save Window Defaults Now* to save the current window settings as the new default. Select *Save Window Defaults on Exit* to save the window settings as they are when you exit the program.

41 Create your own mailing lists. When you find yourself repeatedly addressing mail to the same group of people, it's time to create a private mailing list. A private mailing list lets you address an entire group of users by typing just one name.

To create a mailing list, click the *Address Book* icon or choose *Window • New Address Book Window*. Click the *New* icon or choose *File • New* to display the Add New dialog box. Select *Private Mailing List* and click *OK*. Enter a name for the mailing list and press **<Enter>**.

To add names to the mailing list, click the *New* icon or select *File • New*. Select *Mailing List Participants* from the Add New dialog box and click *OK*. From the Participants list, select the first name you want to add to the list and click *Add*, or drag the name to the Address list box. Continue with these steps until you have added all of the names to the list, then click *Done*.

If many of your mail messages pertain to the same topic, save the subject description so that you don't have to keep retyping it. First you must select *Message • New Message* or click the *Prepare* icon. To save a subject, type the text into the Subject text box, then click the *Subject* button. In the Subjects dialog box, click *Add to list*. Continue adding common subject titles to the list. When you've finished adding subjects, select a subject title from the list and click *OK*. Now, when you create a new message, click the *Subject* button, select the title from the list, and click *OK*.

42 Get right to your mail. Save time when starting cc:Mail by storing your name and password as properties of the cc:Mail program and eliminating the Login dialog box. Keep in mind, however, that by doing so, you leave your mail box open to anyone with access to your PC.

Select the *cc:Mail* program icon and choose *File • Properties* or press **<Alt>-<Enter>**. In the Program Item Properties dialog box, modify the command line as follows:

drive:\directory\WMAIL.EXE *popath "username" password*

The first term, *drive:\directory*\, is the cc:Mail program path, *popath* is the location of the cc:Mail Post Office, *"username"* is your user name, and *password* is your password. For example:

M:\CCMAIL\WMAIL.EXE M:\CCDATA "Jane Doe" XX1045

The next time you start cc:Mail, the program will load without prompting for your name and password. If you decide later that you want password protection, just replace your actual password in the command line with the word **password**. For example:

M:\CCMAIL\WMAIL.EXE M:\CCDATA "Jane Doe" password.

Organizer 1.x

43 Get down to business. You can configure Organizer so that it automatically opens your personal planner when you start the program. In the Program Manager, highlight the *Organizer* icon and select *File • Properties* or press **<Alt>-<Enter>**. In the command line text box, enter the name of

your Organizer file: for example, C:\DATA\ADDBOOK.ORG. If you don't know the file name, click the *Browse* button and use the Drive and Directories menus to locate the Organizer file.

You can also specify the file name from within Organizer. To do so, choose *File•Open*, highlight the file name, select *Open automatically*, and click *OK*. Organizer opens the file. The next time you start Organizer, your file will open automatically.

44 Shift to the Calendar. You can get to the Calendar section quickly from the To-Do, Anniversary, and Planner sections by <Shift>-clicking an entry. For example, while in the Anniversary section, hold down the **<Shift>** key and click an anniversary entry. The Organizer will turn to that date of the current year in the Calendar section. Likewise, <Shift>-click any entry in the To-Do or Planner section, and Organizer will move to the appropriate date in the Calendar section.

45 Link applications to Organizer entries. You've just finished building a 1-2-3 worksheet containing your budget projections for the next year, and you've scheduled a meeting to discuss them. Why not link the worksheet to the meeting entry in the Organizer Calendar section? When the alarm rings 5 minutes before the meeting, you can launch right into 1-2-3 and print the worksheet.

To establish a link between an Organizer entry and any Lotus application, click the Anchor tool, and then click the entry that you want to link. Select *File•Reference*, enter a description of the file that you want to link to, specify the name of the file, and click *OK*. Organizer indicates the association with a chain link and a disk icon to the right of the entry. When you click the disk icon, Organizer launches the application in which the linked file was created and then opens the file. You can use this technique with any Lotus or Windows application as long as a file association has been established in Windows (via the File Manager) for each file type.

46 Speed address entry. When you add a new record to the Address section and click Insert, Organizer flips to the correct page and displays the record you just entered. If you're entering lots of records in your Address section, you can save time by turning this feature off. Select *Options•Address* and deselect the *Turn after Update/Insert* check box.

If you're entering a group of contacts from the same company, enter the first name, last name, and title as usual, but when you get to the Company field, just enter the first word of the company name and press **<Tab>**. Organizer displays the Similar Address Found dialog box. Select the name of the company and click *OK*. Organizer fills in the address, ZIP code, and phone number for the new record.

If you have more than one Address section in an Organizer file—for example, one for business contacts and one for friends and family—and some records belong in both sections, you can save time by copying them between sections. To copy a record to another Address section, drag the record to the Clipboard tool in the ToolBox. Then, click and drag the entry from the Clipboard tool to the tab of the destination Address section.

Faster still: You can bypass the Clipboard by holding down the **<Ctrl>** key while you drag the record to the destination Address section.

To move a record from one Address section to another section, click the *Magnet* tool in the ToolBox, and click the address that you want to move. Then turn to the destination Address section and click on a page or letter tab. You can also simply drag the record to the appropriate destination Address section tab.

Approach 2.1

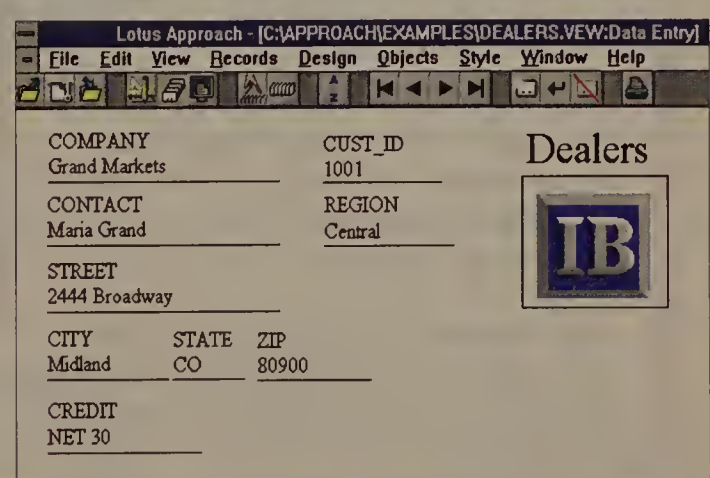
47 Use Datalens to get 1-2-3 data into Approach. If you have a 1-2-3 database table and want to use it in Approach, save the database table as a DBF file. (There is no such thing as an Approach format. Approach uses any one of the conventional formats like dBASE.) Preselect the database range and select *Tools•Database•Create Table*. Then select the DBASE_IV driver, select the drive and directory in the Create Table dialog box, and click *OK*. If the desired drive and directory don't appear, change the 1-2-3 default directory to the desired directory and start over. Enter a name for your dBASE file (without the extension) in the Create Table dialog box, select *Insert Records from Model Table*, and click *OK*.

Then select *File•Open* in Approach, indicate the dBASE_IV file type, and select the name of the file that you just created. Select *View•Browse* and *View•List* to see all of your records.

48 Import 1-2-3 files into Approach. Another way to get 1-2-3 data into Approach is to create a form with an adequate number of fields and the correct field types. Select *File•New*, enter a file name, and select a file type. Click *OK*. Create the appropriate number and types of fields in the Field Definition box and click *OK*. Select *File•Import Data*, select the file type *Lotus 1-2-3*, and specify the file name. Complete the Field Mapping box to map the 1-2-3 fields to the Approach fields.

49 Back up your work. Approach saves changes to your data as you make them; it doesn't wait for you to save your file to write changes to disk. Once you've deleted the contents of a field, they're gone. So if you're not sure about changes you're going to make to your data, back up your file before you work on it.

50 Know your views. There are two default views, Form and List. What you see in either view depends on whether you're in Browse mode or Design mode. In Browse mode, you see actual records from your database. The Form view shows individual records and the List view shows all of the database records. In Design mode you see the layout of the Form and List views without real data.



THE FORM VIEW in Approach's Browse mode shows actual records from your database.

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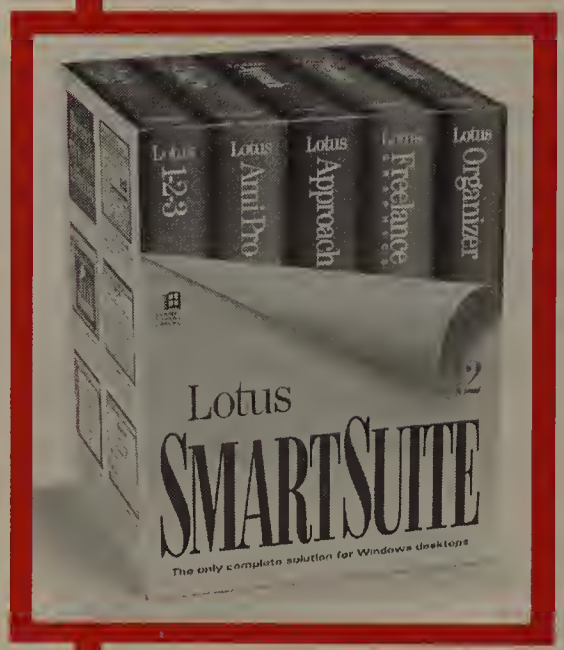

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GARY BASEMAN

START THE YEAR RIGHT WITH 1-2-3 ORGANIZERS

These simple models let you balance your checkbook, plan your diet, create a budget, and remind yourself of key dates.

BY CATHERINE KENNY

Whether you wake up with a foggy memory of last night's champagne or bound out of bed eager to greet the new year, you have definite plans for yourself in 1994. Maybe your goal is to lose those extra 10 pounds, balance your checkbook, or organize your life. But while it's easy to make resolutions, we all know how hard it can be to keep them.

Don't worry: Here are four models that will help you stick to your plans and succeed. To get your finances in order, our Check Register will help you keep track of your bank accounts. To get you and your family in shape, our Meal Planner offers a surefire way to help you lose weight, and a Family Budgeter keeps family finances on track. Finally, a Personal Reminder leaves you with no more excuses for forgetting those important birthdays and meetings, not to mention bills. These models work with all releases of 1-2-3.

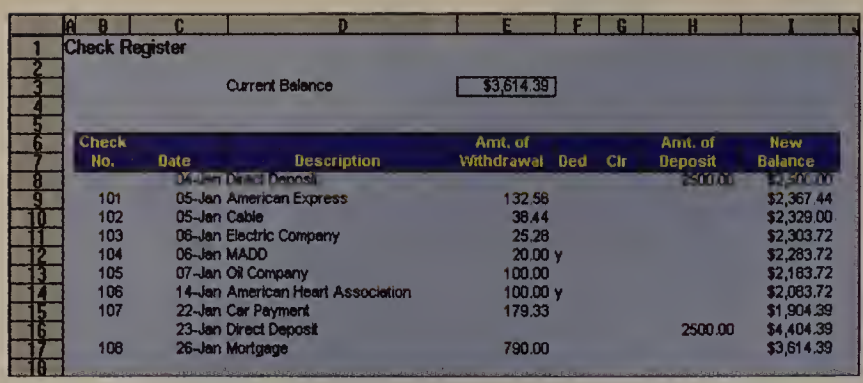
Balance Your Checkbook

How many times have you sat down at the kitchen table and attempted to reconcile your checkbook with all your canceled checks? And how many times have you written a check only to race to the bank to make sure you have funds to cover it?

Well, we've taken the pain and guesswork out of balancing your checkbook by putting control back in your hands. Use our simple Check Register to record all your banking transactions—deposits and withdrawals, voids and returns, and most accursed, bounced checks. You'll receive up-to-the-minute balance information, and you'll be able to assess the state of your funds instantly. And you can do it all in 1-2-3, rather than turning your life over to a financial package like Quicken.

Our model consists of three parts: the check register, the input area, and a macro.

To get started, open a new worksheet, then use the *Worksheet•Column•Set-Width* command (*Style•Column Width* in release



Check Register

Current Balance $3,614.39

Check No.	Date	Description	Amt. of Withdrawal	Ded	Clr	Amt. of Deposit	New Balance
	04-Jan	Direct Deposit				2500.00	$2,500.00
101	05-Jan	American Express	132.56				$2,367.44
102	05-Jan	Cable	38.44				$2,329.00
103	06-Jan	Electric Company	25.28				$2,303.72
104	06-Jan	MADD	20.00	y			$2,283.72
105	07-Jan	Oil Company	100.00				$2,183.72
106	14-Jan	American Heart Association	100.00	y			$2,083.72
107	22-Jan	Car Payment	179.33				$1,904.39
	23-Jan	Direct Deposit				2500.00	$4,404.39
108	26-Jan	Mortgage	790.00				$3,614.39

FIGURE 1: THE CHECK REGISTER records your banking transactions.

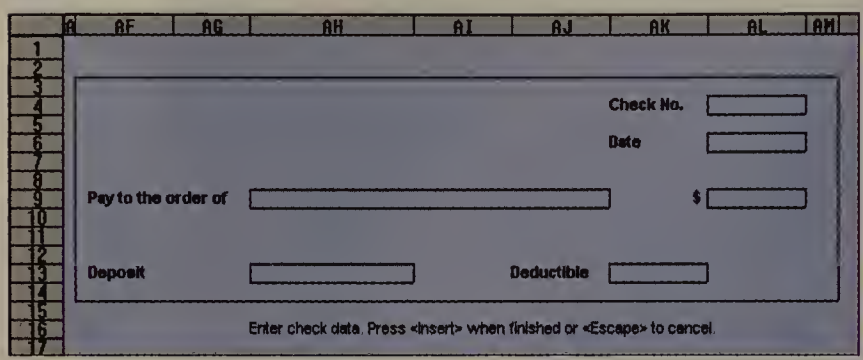


FIGURE 2: A BLANK CHECK input form makes recording checks easier.

4.0) to change the width of column A to 1, column B to 6, column D to 21, column E to 10, and columns F and G to 4.

Next, enter the labels in range A1..I7 (except for the entry in cell E3) of **FIGURE 1**. Center the labels in range B6..I7, and assign the Comma format with two decimal places as the global format. If you're using the Wysiwyg add-in, add the lines and color as follows: Preselect range B6..I7 and choose *:Format•Lines•Outline* followed by *:Format•Lines•Right*. Choose *:Format•Lines•Outline* and indicate cell E3. To add color, preselect range B6..I7, and choose *:Format•Color•Background•Dark-Blue* followed by *:Format•Color•Text•Yellow*. With the range still selected, choose *:Format•Bold•Set* to assign the bold attribute. (You don't have to use Wysiwyg to work with the Check Register.)

Then assign the name **Checkreg** to range B7..I7. Enter the following formula in cell E3: **@INDEX(checkreg,7,@ROWS(checkreg)-1)**. (This formula initially returns 'Balance'.) Assign the Currency format with two decimal places to cell I8. When you've finished, save the file before continuing.

Next, to create the blank check input form shown in **FIGURE 2**, begin by setting the column widths as follows: Set column AE to 1,

```
R              S                T                U
\m             {HOME}/WGZY
               {MENUCALL mainmenu}{BRANCH \m}

mainmenu       Input                Clear                Quit
               Enter transaction    Check has cleared    Exit Check Register
               {enterrec}           {editrec}{INDICATE}  {QUIT}

enterrec       {clear}{FORM inputrng,key_table}
               {WINDOWSOFF}{PANELOFF}{input}

input          /RNCcheckreg~{D}~
               {PUT checkreg,0,@ROWS(checkreg)-1,checknum}~
               {PUT checkreg,1,@ROWS(checkreg)-1,checkdate}~
               {PUT checkreg,2,@ROWS(checkreg)-1,desc}~
               {PUT checkreg,3,@ROWS(checkreg)-1,withamt}~
               {PUT checkreg,4,@ROWS(checkreg)-1,deduct}~
               {PUT checkreg,6,@ROWS(checkreg)-1,depamt}~
               {GOTO}checkreg~{DOWN @ROWS(checkreg)-1}
               /RFG~{RIGHT}/RFD2~{RIGHT 6}+{UP}+{L}-{L 4}~
               {WINDOWSON}{PANELON}

clear          {BLANK checknum}~{BLANK checkdate}~{BLANK desc}~
               {BLANK withamt}~{BLANK deduct}~{BLANK depamt}~

editrec        {WINDOWSOFF}{PANELOFF}/DQIcheckreg~Ccrit~Q
               {GETNUMBER "Enter check number: ",checkno}
               {IF @DCOUNT(checkreg,0,crit)=0}{BEEP}{INDICATE "No entry found."}{BRANCH editcheck}
               /DQF{QUERY}{RIGHT 5}"x~{WINDOWSON}{PANELON}

keys           ~                    {RIGHT}
               {INS}                {FORMBREAK}
               {ESC}                {QUIT}

No.
```

FIGURE 3: THE \M MACRO STARTS the Check Register. Select Input to record a transaction; select Clear when a check has cleared the bank.

	A	B	C
1	DAILY MEAL PLANNER		
2			
3	BREAKFAST		Calories
4	Yogurt,nonfat,plain, 3/4 cup		90
5	Bagel, 1/2 small		80
6	Grapefruit, 8 oz		60
7			
8			
9	Total		230
10			
11	LUNCH		
12	Instant nonfat dry, 1/3 cup		90
13	Salad dressing, 1 1/2 tsp		40
14	Deli meat, 1 oz		60
15	Bread (any type), 1 slice		80
16	Banana, 3 oz		60
17	Total		330
18			
19	DINNER		
20	Margarine, 1 tsp		40
21	Fish and shellfish, 2 oz		60
22	Pasta, 1/2 cup cooked		80
23	Broccoli		0
24	Carrots		0
25	Total		180
26			
27	Daily Calorie Intake		740

FIGURE 4: THE DAILY MEAL PLANNER helps you keep track of what you eat and how many calories you consume.

column AG to 7, column AH to 15, and column AM to 3.

Assign the range names **Checknum** to cell AL4, **Checkdate** to cell AL6, **Desc** to cell AH9, **Withamt** to cell AL9, **Depamt** to cell AH13, **Deduct** to cell AK13, **Inputrng** to AE1..AN15, and **Checkno** to cell R134.

To add the lines, preselect range AF3..AM14 and choose *:Format•Lines•Outline.* Perform the same command for the following cells: AL4, AL6, AL9, AH9, AH13, and AK13. Enter the labels shown in range AF4..AK16. Unprotect cells AL4, AL6, AL9, AH9, AH13, and AK13. Assign the Date 2 format to cell AL6. Assign the bold attribute to the following cells: AF9, AF13, AJ13, AK4, AK6, and AK9.

Now create the macro. First enter the labels in range R100..U133 of **FIGURE 3**. Be sure to precede the entries that begin with a slash (/) or backslash (\) with an apostrophe label prefix. Assign the labels in range R100..R124 as range names for the adjacent cells in column S. Assign the name **Key_Table** to range S129..T131 and the name **Crit** to range R133..R134. Save the file.

To use the check register, hold down the **<Alt>** key (**<Ctrl>** in 1-2-3/W) and press **M**. The main menu appears with the options Input, Clear, and Quit. The Input command allows you to enter a transaction, whether it's a deposit or withdrawal; Clear indicates that a check has cleared the bank; and Quit ends the macro and returns 1-2-3 to Ready mode.

To enter a transaction, select *Input* and fill in the data-entry form. If you're recording a check, enter the number in the Check No. field. If you're recording a withdrawal, enter **WD** or **ATM** in the Check No. field. If you're entering a deposit, leave the Check No. field blank.

Enter the date, a brief description of the transaction, and the amount of the transaction in the appropriate fields. If you're recording a deposit, enter the amount in the Deposit field. If your check represents a tax-deductible item, enter **Y** in the Deductible field. When you've finished entering the information, press **<Insert>** to save the data in the Check Register. To cancel an entry, press **<Esc>**. The macro ends and returns 1-2-3 to Ready mode.

When a check has cleared, select *Clear*, and enter the check number. When the check item is found, the macro enters the label *X* in the Clear column of the Check Register.

You'll be the envy of all your friends and colleagues when you announce that your checkbook is always balanced. 1-2-3, your very own personal banker, sees to that.

Watch Your Weight

If you're entering a new year with the same old body shape, it can seem like forever before your diet kicks in and those pounds finally melt away. Many people rely on crash dieting to help them lose weight fast, but the pounds usually come back just as quickly. Successful diet workshops these days focus not just on losing weight but on keeping it off. And maintaining an ideal weight means learning to eat right and getting enough exercise.

In the Daily Meal Planner model, we've gathered a list of foods from each of the food groups and specified a typical serving size and the calorie content per serving. Then a macro helps you plan each of your meals for the day.

When you select your choices, the macro enters the food selections and calorie counts in the appropriate section of the daily menu. The macro tallies up the calories for that meal and then the total calories consumed for the day.

So try out this macro to plan your meals or just to get a feel for how many calories you consume in a day. As a very rough rule of thumb, women often aim for 1000 calories of a healthy balanced diet per day, while men try for 1200 calories per day. But consult your doctor or a health professional before starting any diet.

To build the Meal Planner, open a new worksheet and set the width of column A to 30, columns P and T to 3, column Q to 24, and column U to 20.

Next, enter the labels shown in range A1..C27 of **FIGURE 4**. (Don't enter the menu items and calorie counts currently shown.) To add the lines, choose *:Format•Lines•Outline* and indicate ranges A3..C9, A11..C17, A19..C25, and A27..C27. Next, choose *:Format•Lines•Bottom*, and indicate ranges A3..C3, A8..C8, A11..C11, A16..C16, A19..C19, and A24..C24. (You don't have to use Wysiwyg to work with the Daily Meal Planner.)

Enter the labels and values shown in **FIGURE 5**. (Note that the vegetable items are shown with zero calories. While vegetables do indeed have calories, many diet-management professionals consider that vegetables' nutritional benefits far outweigh their comparatively negligible calorie counts.)

	P	Q	R	S	T	U	V
1		DAIRY				GRAINS	
2		Buttermilk, 1 cup	90			Bagel, 1/2 small	80
3		Evaporated skimmed, 1/2 cup	90			Bread (any type), 1 slice	80
4		Instant nonfat dry, 1/3 cup	90			Cereal,cold,plain 3/4 oz	80
5		Skim, nonfat, or 1%, 1 cup	90			Pasta, 1/2 cup cooked	80
6		Yogurt,nonfat,plain, 3/4 cup	90			Rice, 1/2 cup	80
7							
8							
9							
10		FAT				FRUIT	
11		Margarine, 1 tsp	40			Apple, 4 oz	80
12		Mayonnaise, 1 tsp	40			Banana, 3 oz	60
13		Peanut butter, 1 tsp	40			Grapefruit, 8 oz	60
14		Salad dressing, 1 1/2 tsp	40			Orange, 6 oz	80
15		Vegetable oil, 1 tsp	40			Grapes, 3 oz	80
16							
17							
18							
19		PROTEIN				VEGETABLES	
20		Beef,lamb,pork 1 oz	60			Broccoli	0
21		Deli meat, 1 oz	60			Carrots	0
22		Fish and shellfish, 2 oz	60			Lettuce	0
23		Cottage cheese,nonfat, 1/2 cup	60			Spinach	0
24		Egg	60			Celery	0

FIGURE 5: ITEMS FROM THE FOOD GROUPS appear in the selection menu, along with serving sizes and calories per serving.

To create the macro, enter the labels shown in **FIGURE 6**. Precede entries that begin with a slash or backslash with an apostrophe label prefix.

Use the *Range•Name•Create* command to assign the following range names:

NAME	RANGE	NAME	RANGE
Bfast	A4..C4	**Select1**	P1..P24
Lunch	A12..C12	**Select2**	T1..T24
Dinner	A20..C20	**Menu**	P1..V24

Assign the labels in range AB100..AB141 as range names for the adjacent cells in column AC.

Finally, enter the following formulas in the cells indicated:

CELL	FORMULA
C9	**@SUM(C4..C8)**
C17	**@SUM(C12..C16)**
C25	**@SUM(C20..C24)**
C27	**@SUM(C9,C17,C25)**

To begin planning your meals for the day, press **<Alt>-L** (**<Ctrl>-L** in 1-2-3/W). The main menu appears with the options *Breakfast*, *Lunch*, and *Dinner*. When you select a menu item, the macro clears any previous items you may have chosen for the meal. (Note that each section of the menu allows for only five items. If you plan to select more than five, adjust the menu and range names accordingly.)

To plan your breakfast, choose *Breakfast* from the main menu. The macro pauses and waits for you to select from the list of foods. Use the arrow keys to move the pointer to the appropriate selection. To mark a food item for inclusion, type an **x** to the left of the item. To deselect an item, type a **0** in place of the x. When you're finished making selections for your meal, press **<Enter>**. The macro enters the selections in the Breakfast section of the daily menu and computes total calories both for that meal and for the entire day.

The Meal Planner, while helping you count calories, also helps you keep track of your eating habits. Armed with the information the Meal Planner provides, you might find it easier to decrease your calorie consumption and increase your weight loss.

```
     AB          AC          AD          AE
100  \l          {PANELOFF}
101              {MENUCALL mainmenu}
102
103  mainmenu    Breakfast        Lunch            Dinner
104              Plan breakfast   Plan lunch       Plan dinner
105              {getem bfast}    {getem lunch}    {getem dinner}
106
107  getem       {DEFINE meal}{BLANK select1}~{BLANK select2}~
108              {prepare}{GOTO}menu~
109              {INDICATE "Mark items with an x. Press Enter when done."}{?}~{INDICATE}
110              {WINDOWSOFF}
111              {GOTO}select1~
112              {FOR ctr,1,@ROWS(menu),1,findx}
113              {GOTO}select2~
114              {FOR ctr,1,@ROWS(menu),1,findx}
115              {HOME}
116
117  findx       {IF @CELLPOINTER("type")="l"}{movetomenu}
118              {DOWN}
119
120  movetomenu  {RIGHT}
121              {LET item,@CELLPOINTER("contents")}
122              {RIGHT}{LET cal,@CELLPOINTER("contents")}
123              {getmeal}
124              {LEFT 2}
125
126  getmeal     {PUT +meal,0,@ROWS(@@(meal))-1,item}
127              {PUT +meal,2,@ROWS(@@(meal))-1,cal}
128              /RNC{meal}~{D}~
129
130  prepare     {IF @ROWS(@@(meal))=6}/RNC{meal}~{UP}~
131              {BLANK +meal}
132              {IF @ROWS(@@(meal))-1=0}{RETURN}
133              /RNC{meal}~{UP @ROWS(@@(meal))-1}~
134
135  ctr
136
137  item
138
139  cal
140
141  meal
```

FIGURE 6: PLAN YOUR MEALS with the \L macro, which will help prepare a menu for you.

The Family Budget

If you've made a resolution to keep a close eye on your spending habits, then this worksheet can give you a clear picture. It offers a simple way to track your income and monitor your spending. By adhering to monthly spending goals you set for yourself, you'll see your savings increase and your debt decrease.

The worksheet shown in **FIGURE 7** is modeled after a simple family budget. The labels in column A reflect common income and expense categories. You enter budgeted values in column B and actual values in column C. Formulas in column D calculate the variance between the actual and budgeted values. Scrutinize these calculations each month to see how you're doing.

To build the worksheet, set the width of column A to 32. Assign the Comma format with two decimal places as the global format. Then enter the labels shown in column A and in range B2..D3 and B12..D12. Precede the entries in range A4..A7 and range A13..A25 with a space. Right-align the labels in range B3..D3 and range

	A	B	C	D
1	FAMILY BUDGET			
2			Jan	
3	Income	Budget	Actual	Variance
4	Salary	5,000.00	5,000.00	0.00
5	Other Income	100.00	200.00	100.00
6	Interest	75.00	75.00	0.00
7	Stocks	200.00	175.00	(25.00)
8				
9	Total Income	5,375.00	5,450.00	75.00
10				
11				
12	Expenses	Budget	Actual	Variance
13	Mortgage/Rent	1,000.00	1,000.00	0.00
14	Car Payment	170.00	170.00	0.00
15	Car Insurance	150.00	150.00	0.00
16	Utilities	100.00	92.00	8.00
17	Food	400.00	555.00	(155.00)
18	Clothing	100.00	325.00	(225.00)
19	House Expenses	250.00	890.00	(640.00)
20	Transportation	100.00	100.00	0.00
21	Entertainment	100.00	356.00	(256.00)
22	Personal	250.00	455.00	(205.00)
23	Gifts	50.00	85.00	(35.00)
24	Charity	100.00	100.00	0.00
25	Medical	75.00	0.00	75.00
26				
27	Total Expense	2,845.00	4,278.00	(1,433.00)
28				
29	Net Income available for Savings	2,530.00	1,172.00	(1,358.00)
30				

FIGURE 7: A SIMPLE BUDGET HELPS you keep an eye on your buying habits and curb unnecessary spending.

B12..D12. Enter the formula **+B4-C4** in cell D4 and copy it to ranges D5..D7 and D13..D25. Enter the formula **@SUM(B4..B7)** in cell B9 and copy it to range C9..D9. Enter the formula **@SUM(B13..B25)** in cell B27 and copy it to range C27..D27. Enter the formula **+B9-B27** in cell B29 and copy it to cell C29. Finally, enter the formula **+C29-B29** in cell D29.

To extend the budget for each additional month—for example, to budget for February—copy range B2..D31 to cell E2 and enter the label **^Feb** in cell E2.

As the months go by, your spending habits will be revealed. You'll know where you need to curb your spending so that you can keep more of your hard-earned money in the bank.

Assistant editor Catherine Kenny promises to use all these macros to improve her daily life in 1994. Really.

Models on Disk includes the models, macros, and formulas in this article. To order, call 800/824-5520 or write to *PC World Lotus Edition*, Models on Disk, P.O. Box 1743, Salisbury, MD 21802-9830. Individual disks are $9.95; a full year's subscription is $89.95. This material is also available from PC World Online on America Online and on CompuServe; see page 12 for more information about PC World Online.

PERSONAL REMINDER

If you've ever been embarrassed because you forgot a special occasion or because you just can't seem to manage to get your car payment in on time each month, a little prompting couldn't hurt. Our simple Personal Reminder macro notifies you of important dates every time you start 1-2-3 and then lets you get on with your day's work.

To create the Personal Reminder macro, start in a blank worksheet, and enter the following formulas:

CELL	FORMULA
A1	@IF(@DATE(@YEAR(@NOW),1,19)-@INT(@NOW)>=0#AND#@DATE (@YEAR(@NOW),1,19)-@INT(@NOW)<=10,B1,"")
A2	@IF(@DAY(@NOW)<=22#AND#@DAY(@NOW)>=17,B2,"")
B1	Mom's Birthday 1/19
B2	+"Car Payment Due "&@STRING(@MONTH(@NOW),0)&"/22"

Enter the labels shown in range A5..B21 of the worksheet in the figure at right. Type 30 spaces between each set of quotes in cell B15. Assign the labels in range A5..A21 as range names for the adjacent cells in column B. Assign the range name Test to range A1..A2. Save the file under the name AUTO123. (Make sure that you save the file in the default 1-2-3 directory.) Finally, select */Worksheet • Global • Default • Autoexecute • Yes • Update • Quit.* In 1-2-3/W, select *Tools • User Setup*, click *Run autoexecute macros*, and click *OK*.

The formula in cell A1 reminds you of annual events. For example, my mother's birthday is January 19. I want to be reminded for 10 days before the big day. The formula subtracts the current date from January 19 of the current year and checks to see if the difference between the two dates is less than or equal to 10 days. If it is, the formula returns the entry in cell B1. Otherwise, it returns a blank.

The formula in cell A2 reminds you of monthly events. For example, my car payment is due to the bank on the 22nd of each month. I want the macro to alert me at least 5 days before the bill is due. So the formula checks the current day to see if it is less than or equal to 22 and greater than or equal to 17. If it is, the formula returns the contents of cell B2. Otherwise, it returns a blank.

To run the macro, just start 1-2-3. If the macro finds a reminder for the current day, it displays it in the control panel for 5 seconds. Then it activates the File • Retrieve command and pauses while you select the file you need.

With the Personal Reminder macro by your side, you'll never forget an important date again.

```
    A          B
5   \0         {IF @SUM(test)<@COUNT(test)}{remind}
6              /FR{NAME}
7
8   remind     {GOTO}test~
9              {FOR ctr,1,@ROWS(test),1,look}
10
11  look       {IF @CELLPOINTER("contents")<>""}{show}
12             {DOWN}
13
14  show       {LET rester,@CELLPOINTER("contents")}~
15             {INDICATE +"   "&@S(rester)&"      "}
16             {BEEP}{BEEP}{BEEP}
17             {WAIT @NOW+@TIME(0,0,05)}{INDICATE}
18
19  rester
20
21  ctr
```

THE PERSONAL REMINDER MACRO helps you recall important dates.

Add Special Characters to Your Worksheet

Like most software, 1-2-3 recognizes ASCII characters—the letters, numbers, punctuation marks, and mathematical symbols that appear on your keyboard. These 95 characters, plus control characters such as <Enter>, <Tab>, and <Delete>, are usually all you need to get data into and out of your worksheet.

But sometimes ASCII isn't enough. Fortunately, each version of 1-2-3 comes with a larger set of characters that includes ASCII and dozens of special characters like the British pound sign, the German umlaut, and the Spanish ñ.

You can use these special characters almost anywhere in your worksheet—in labels, range names, and headers and footers. But because each release handles these characters somewhat differently, you should avoid them in worksheets that you're likely to share.

A Choice of Character Sets

Release 2.*x* uses the Lotus International Character Set (LICS) to display, store, and print characters. Each LICS character is identified by a numeric code. Codes 0 through 31 represent control characters; 32 through 127 are ASCII characters; and 128 through 255 represent various international characters.

Release 3.*x* uses the Lotus Multibyte Character Set (LMBCS), which includes all the characters in LICS and ASCII, plus most other international character sets. LMBCS codes 32 through 127 are ASCII characters, and codes 128 through 511 are characters previously available in LICS, as well as other characters that duplicate LMBCS codes of other countries.

1-2-3 for Windows release 1.*x* and release 4.0 for Windows use the American National Standards Institute (ANSI) Windows character set to display and print characters, and they use the LMBCS to store characters.

Some monitors and printers cannot display or print all LICS or LMBCS characters. In these cases, 1-2-3 uses a fallback character that resembles the character you're trying to reproduce. For example, the copyright symbol may appear either as a lowercase c or as (c).

See your 1-2-3 reference or user guide for more on LICS and LMBCS.

@Functions and Keyboard Combos

To accommodate all these characters, your keyboard would have to be huge. Fortunately, 1-2-3 provides @functions and keyboard combinations that let you reproduce them.

The @CHAR(*n*) function returns the character that the LICS or LMBCS *n* represents. @CHAR(90) returns the Japanese yen sign (¥) in release 3.*x* and later. In release 2.*x*, @CHAR(190) returns ≤. The @CODE("*string*") function works the opposite way, returning the LICS or LMBCS code that corresponds to *string*. @CODE("A") returns 65, the ASCII code for an uppercase A.

Let's create a worksheet that reveals all the characters in LICS or LMBCS. Fill range A1..A255 with the numbers 1 through 255 (in release 4.0, you can create a larger fill range to see what numbers greater than 255 return). One way to do this is to select */Data•Fill*, select range A1..A255 as the range to fill, enter **1** as the start value, and accept the default step and stop values. In 1-2-3/W release 1.*x*, the Fill command is on the pulldown Data menu; in release 4.0, Fill is on the Range menu.

Now enter **@CHAR(A1)** into cell B1, and copy it to range B2..B255. The first 32 cells of column B will remain blank in 1-2-3 release 2.*x*, display characters in release 3.*x*, and display a box character in 1-2-3/W release 1.*x* and release 4.0 (as shown in **FIGURE 1**—we rearranged the codes to save space). The remaining cells will contain visible characters.

Using Compose Sequences

Another way to reproduce a special character in your worksheet is to use a *compose sequence*, a series of keystrokes prefaced by the COMPOSE key

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	1	▌	23	▌	45	–	67	C	89	Y	111	o	133	à	155	ø	177	▌	199	Ã	221	¦	243	¾
2	2	▌	24	▌	46	.	68	D	90	Z	112	p	134	å	156	£	178	▌	200	▌	222	Ì	244	¶
3	3	▌	25	▌	47	/	69	E	91	[	113	q	135	ç	157	Ø	179	▌	201	▌	223	•	245	§
4	4	▌	26	▌	48	0	70	F	92	\	114	r	136	ê	158	×	180	▌	202	▌	224	Ó	246	÷
5	5	▌	27		49	1	71	G	93	]	115	s	137	ë	159	▌	181	Á	203	▌	225	ß	247	¸
6	6	▌	28	▌	50	2	72	H	94	^	116	t	138	è	160	á	182	Â	204	▌	226	Ô	248	°
7	7	▌	29	▌	51	3	73	I	95	_	117	u	139	ï	161	í	183	À	205	▌	227	Ò	249	¨
8	8	▌	30		52	4	74	J	96	`	118	v	140	î	162	ó	184	©	206	▌	228	õ	250	·
9	9	▌	31		53	5	75	K	97	a	119	w	141	ì	163	ú	185	▌	207	¤	229	Õ	251	¹
10	10	▌	32		54	6	76	L	98	b	120	x	142	Ä	164	Ñ	186	▌	208	ð	230	µ	252	³
11	11	▌	33	!	55	7	77	M	99	c	121	y	143	Å	165	Ñ	187	▌	209	Ð	231	þ	253	²
12	12	▌	34	"	56	8	78	N	100	d	122	z	144	É	166	ª	188	▌	210	Ê	232	Þ	254	•
13	13	▌	35	#	57	9	79	O	101	e	123	{	145	æ	167	º	189	¢	211	Ë	233	Ú	255	
14	14	▌	36	$	58	:	80	P	102	f	124		146	Æ	168	¿	190	¥	212	È	234	Û		
15	15	▌	37	%	59	;	81	Q	103	g	125	}	147	ô	169	®	191	▌	213	ı	235	Ù		
16	16	▌	38	&	60	<	82	R	104	h	126	~	148	ö	170	¬	192	▌	214	Î	236	ý		
17	17	▌	39	'	61	=	83	S	105	i	127	▌	149	ò	171	½	193	▌	215	Ì	237	Ý		
18	18	▌	40	(	62	>	84	T	106	j	128	Ç	150	û	172	¼	194	▌	216	Ï	238	¯		
19	19	▌	41	)	63	?	85	U	107	k	129	ü	151	ù	173	¡	195	▌	217	▌	239	´		
20	20		42	*	64	@	86	V	108	l	130	é	152	ÿ	174	«	196	▌	218	▌	240	-		
21	21	▌	43	+	65	A	87	W	109	m	131	â	153	Ö	175	»	197	▌	219	▌	241	±		
22	22		44	,	66	B	88	X	110	n	132	ä	154	Ü	176	▌	198	Ã	220	▌	242	_		

FIGURE 1: REVEAL ALL OF 1-2-3's SPECIAL CHARACTERS with the @CHAR function.

PETER ALSBERG

TO CREATE	PRESS COMPOSE, AND ENTER
é	e'
ü	u "
©	co
®	ro
¼	14
«	<<
»	>>
ß	ss
±	+-
÷	-:
¢	|c
£	L=
¥	Y=
¿	??
°	^0
·	^.
¹	^1

FIGURE 2: MOST COMPOSE SEQUENCES resemble the resulting characters. Here are a few common ones.

(<Alt>-<F1>). Since 1-2-3 doesn't have a macro key name for the COMPOSE key, you'll have to use the @CHAR function in a macro.

Most compose sequences involve characters that resemble the ones you're trying to create. To create the Spanish character ñ, press **<Alt>-<F1>**, type the letter **n** followed by a tilde (~), and press **<Enter>**. To create a symbol that represents the fraction one-half (½), press **<Alt>-<F1>** and enter **I** followed by **2. FIGURE 2** lists several popular characters and the compose sequences that create them. All these sequences work in releases 3.*x*, 1-2-3/W 1.*x*, and 4.0, although some don't work in 2.*x*.

You can use a compose sequence when you enter a label, a value, or a formula, even when typing entries in response to command prompts and in dialog boxes.

If you're building a worksheet that represents currency in British pounds, set 1-2-3's default currency symbol to the pound. In releases 2.*x* and 3.*x*, select */Worksheet•Global•Default•Other•International•Currency*, and press **<Backspace>** to remove the existing symbol. Then press **<Alt>-<F1>** and enter **L** followed by = (the equal sign). Choose *Prefix* to place the new symbol in front of each formatted number, then select *Quit* twice. Throughout your work session, currency formats will appear with pound signs rather than dollar signs. If you want to keep this setting for your future work sessions, select */Worksheet•Global•Default•Update• Quit.*

To change the default currency symbol in 1-2-3/W release 1.*x* and release 4.0, select *Tools•User Setup*, and click *International.* Delete the current symbol in the Symbol for Currency box. Change the contents of this edit box by pressing **<Alt>-<F1>** and typing **L=**; then choose *Prefix* and click *OK* twice. To keep this currency setting for future work sessions in release 1.*x*, select *Tools•User Setup*, click *Update*, then click *OK*. This setting is saved automatically in release 4.0, so if you want to change it only for the current work session, you'll have to change it back when you're finished.

Embedding Special Characters

If you know which keys to press, you can change the fonts, attributes, and colors of selected characters in a cell and leave other characters unchanged. The trick is to apply the Begin Attribute and End Attribute compose characters. In releases 2.3, 2.4, 3.1+, and 3.4, also make sure you've attached Wysiwyg.

Suppose you want the word *exceeded* to appear boldface in the label 'Sales have **exceeded** all expectations!' To begin, type **Sales have** and press **<Space>**. Press **<Alt>-<F1>** and type **ba** to begin the special attribute. (In releases 2.3, 2.4, 3.1+, and 3.4, you can also press **<Ctrl>-A.**) Type a lowercase **b** (for boldface), then type **exceeded.** Now press **<Alt>-<F1>** and type **ea** to end the attribute (in releases 2.3, 2.4, 3.1+, and 3.4, you can also press **<Ctrl>-Eb**, which stands for End Bold, or **<Ctrl>-N**, which marks the end of a formatting sequence). Finish typing the sentence, and press **<Enter>**. You can also embed special attribute codes in strings. Some of these are shown in **FIGURE 3.** Be aware that each attribute doesn't necessarily work in every release of 1-2-3.

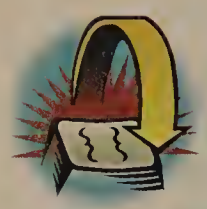
Still, this powerful collection of commands gives you significant control over the look of your spreadsheets. Following Figure 3, try to enter several labels that incorporate some of the special compose sequences. Meanwhile, be on the lookout for opportunities to spruce up your spreadsheet presentation by adding compose sequence characters.

TO CREATE	PRESS COMPOSE, AND ENTER
boldface	b
subscript	d
italics	i
superscript	u
characters reversed	x
characters upside down	y
underline	1_
double underline	2_
wide underline	3_
box around data	4_
strike through characters	5_
switch to default color set	1c
text in red	2c
text in green	3c
text in dark blue	4c
text in cyan	5c
text in yellow	6c
text in magenta	7c
data and background colors reversed	8c
switch to font #1 (up to 8F, which switches to font #8)	1F

FIGURE 3: ASSIGN SPECIAL ATTRIBUTES to strings by pressing COMPOSE (<Alt>-<F1>) and entering these codes.

By Daniel Gasteiger

Daniel Gasteiger is coeditor of The Spreadsheet Consultant, *published by Gasteiger & Delonas Inc. in Boston.*



Sampling Release 4.0 Macros

With each go-around, 1-2-3 features a few new macro commands and a few variations in the menu that affect keystroke macros. If you've been reading *Macro Basics* and *Advanced Macros* for long, you've probably noticed that our instructions have grown longer to accommodate these differences. It hasn't been too difficult to cover all the bases—until release 4.0.

With 1-2-3 release 4.0 for Windows, Lotus has taken a new approach to macros. Since macros can no longer access the menu bar, the language now contains commands like {FILE-OPEN} and {RANGE-NAME-CREATE}.

Fortunately, release 4.0 comes with a worksheet file containing a variety of sample macros to help you get started with this new approach. The 12 sheets include macros that let you design your own dialog boxes and customize menus or menu commands. Each sheet contains one or more on-screen *Example* buttons that you can click to demonstrate the macro, as in **FIGURE 1**.

To see the file, choose *File•Open* and select the file named *UIMACROS.WK4* from your default worksheet directory.

Display a Message With {ALERT}

The first command in the sample file, {ALERT}, lets you interrupt a macro to post a warning, provide information about the worksheet, or request user confirmation. The *message* argument is the text you want 1-2-3 to display. The optional *buttons* argument tells 1-2-3 which buttons to display, both OK and Cancel, or just OK (the default). The optional *icon-type* argument tells 1-2-3 what type of icon to display.

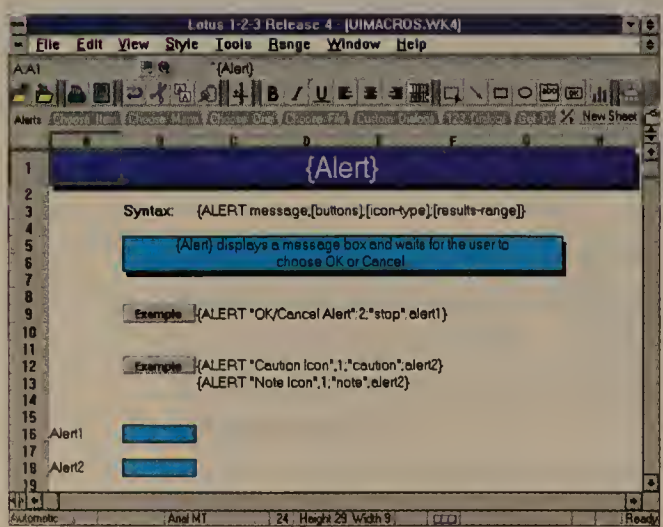


FIGURE 1: PRESS ONE OF THE ON-SCREEN Example buttons to see how a macro command works.

Click the first *Example* button to see the Stop icon. Press the second *Example* button to see the Caution and Note icons. Notice the numbers that appear in the cells named Alert1 and Alert2, the results ranges. When you click *OK*, the macro places a '1' in the *results-range*. When you click *Cancel*, it returns '0'.

{Choosing} a Dialog Box

Each of the next four sheets in the sample file contains a macro that displays a dialog box with a list of choices. The type of {CHOOSE} command you use determines the way the list is displayed, the number of items you can choose from the list, and the action the macro performs when you make your choice.

Click the worksheet tab marked *Choose Item* to get to the next sheet in the sample file, and press *Example*. The {CHOOSE-ITEM} command presents a dialog box with a scrolling list of states, taken from the range named States (see **FIGURE 2**). Each entry in States corresponds to a number, beginning with 0. Click any state in the list, then click *OK*. The macro enters the number of your choice in the cell named StatePick. The @INDEX function in the second line of the macro translates the number in StatePick back into a state name, and the {ALERT} command displays a dialog box notifying you that you have picked a specific state. Click *OK* to confirm.

The {CHOOSE-MANY} command on the next sheet presents your choices as check boxes. Click *Example*, then press the check box labeled Income Statement. Notice that the second check box remains selected. You can include up to eight check boxes in the *choices-range*. This range requires three rows: The first row includes the check box labels; the second row defines the initial status for the check boxes (0 = off, 1 = on, NA = dimmed); and the third row records the state of the check box after you choose OK. The *results-range* returns '1' if the user chooses OK, '0' if the user chooses Cancel.

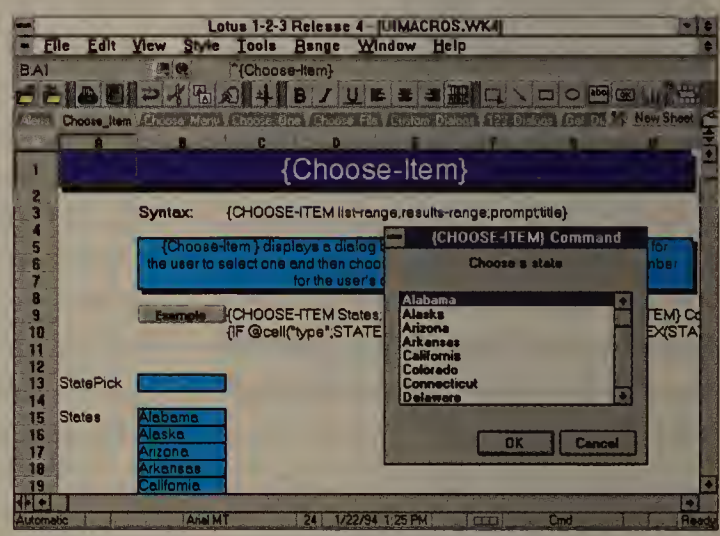


FIGURE 2: THE {CHOOSE-ITEM} COMMAND in this example presents a dialog box with a list of states, which are taken from the range beginning in cell B15.

{CHOOSE-ONE} is similar to {CHOOSE-MANY} except that its dialog box displays your choices as radio buttons instead of check boxes and allows you to choose only one item. In the example, the macro lets you choose from among four items (the fifth is dimmed), and when you select *OK*, it asks you to confirm your selection.

The *choices-range* in {CHOOSE-ONE} also has three rows (though it can have more), but here the third row contains additional macro commands or the name of a macro to execute.

Finally, the {CHOOSE-FILE} macro displays a standard Windows File Open dialog box. In the *file-type* argument, you specify the type of files the macro will display in the dialog box. When you select a file from the list and click *OK*, the macro places the file name in the

results-range. You can include additional commands below {CHOOSE-FILE} to perform an action on the selected file.

Start a Dialog

The macros in the Custom_Dialogs sheet show examples of dialog boxes created with the Dialog Editor. After you compose your dialog box, you copy it to the Clipboard, then paste it into a worksheet, where it takes the form of a dialog box description table. The *dialog-definition-range* argument is the name or address of the first cell in this table. For more on using the Dialog Editor, see chapter 26 in the release 4.0 user guide.

The {DIALOG?} command opens the 1-2-3 dialog box specified in the *name* argument. The table in **FIGURE 3** lists the names of all 1-2-3 release 4.0 dialog boxes, by menu. For a complete description of the syntax rules for this macro command, see the online help.

Each of the {GET-} commands on the next sheet displays a dialog box with ▶

FILE MENU
Open
Save-As
Save-Copy-As
Protect
Send-Mail
Print-Preview
Page-Setup
Print
Printer-Setup

EDIT MENU
Clear
Paste-Special
Insert
Delete
Find-and-Replace
Go-To
Insert-Object
Links

VIEW MENU
Freeze-Titles
Split
Set-View-Preference

HELP MENU
About-123

QUERY MENU
Set-Criteria
Choose-Fields
Query-Sort
Aggregate
Join
Show-Field-As
Show-SQL
Query-Name
Set-Options
Set-Database-Table

STYLE MENU
Number-Format
Font-and-Attribute
Lines-and-Color
Alignment
Gallery
Named-Style
Column-Width
Row-Height
Protection
Hide
Page-Break
Worksheet-Defaults

TOOLS MENU
New-Query
Find-Records
Delete-Records
Append-Records
Crosstab
Connect-to-External
Send-Command
Spell-Check
Audit
SmartIcons
User-Setup
Assign-to-Button
Add-in

RANGE MENU
Version
Fill
Range-Sort
Parse
Transpose
Range-Name
What-if-Table
Solver
Backsolver
Distribution
Regression
Invert-Matrix
Multiply-Matrix

CHART MENU
Type
Ranges
Headings
Legend
Data-Labels
Grids
X-Axis
Y-Axis
2nd-Y-Axis
Chart-Name
Numeric-Color

FIGURE 3: REPLACE THE {DIALOG?} COMMAND'S name argument with any of these names.

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a text box and waits for you to enter information and click OK or Cancel. If you include all arguments, the dialog box also displays a user prompt, a default entry, and a dialog box title. The only required argument is *result*, which tells the macro where to place your entry.

{GET-FORMULA}, {GET-NUMBER}, and {GET-RANGE} let you specify the name or address of a cell in the text box. But only {GET-RANGE} lets you specify a cell by selecting it in the worksheet or by using the Range SmartIcon. {GET-LABEL} enters exactly what you type in the text box, even if it's the name or address of a cell.

Customize 1-2-3's Menus

The last four sheets in the sample file contain macros that let you customize the 1-2-3 menu bar. {MENU-COMMAND-ADD} and {MENU-COMMAND-REMOVE} let you add a command to and remove a command from a pulldown menu. Click the first *Example* button in the 'Menu_Command_1' worksheet, then click *File* on the 1-2-3 menu. As you can see, the macro has added the command Payroll to the top of the File menu. To remove the command, click the second *Example* button.

{MENU-COMMAND-ADD} takes three arguments. The first, *menu-range*, is a five-row range that defines the new command. The first row in this range contains the name of the command; the second row contains the description 1-2-3 will display when you highlight the command; the third row indicates how the command should appear (checked, dimmed, or normal); the fourth row is blank; and the fifth row contains the commands or the name of the macro you want 1-2-3 to perform when the item is selected. The remaining arguments indicate the position of the menu you're adding to (File = 1, Edit = 2, and so on) and the position of the added command on the specified menu (starting with 1). To reverse the effect, use {MENU-COMMAND-REMOVE}.

{MENU-COMMAND-ENABLE}/{MENU-COMMAND-DISABLE} simply turn off or on the 1-2-3 menu command identified in the *menu-index* and *command-index* arguments.

{MENU-CREATE} lets you replace the current menu bar with a customized bar. To insert a pulldown menu in the existing menu bar, use {MENU-INSERT} instead. Both commands use the *menubar-description-range* argument to define the position and effects of the custom commands. This range is like the five-row range specified in the *menu-range* argument in the {MENU-COMMAND-ADD} macro.

{MENU-INSERT} also uses the *menu-index* argument to tell 1-2-3 where to insert the new pulldown menu.

By Joseph Levine

Joseph Levine is a principal technical writer/editor at Lotus Development Corporation in Cambridge, Massachusetts. ■

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Utility Macros Save Time

One thing I hate about the Windows versions of 1-2-3 is the dialog box that appears when I want to print a range. When I highlight a range and then select File•Print, or click the printer SmartIcon, or press <Ctrl>-P in release 4.0, I expect 1-2-3 to print the range I've selected, not wait for me to click OK in a dialog box.

Everyone has a pet peeve like this or wishes for a feature that's not there. Fortunately, you can often get 1-2-3 to behave the way you want by writing a short utility macro. Here, we'll look at a few of my favorites: macros for printing, file naming, and toggling between manual and automatic recalculation. These little gems may give you ideas for creating your own. (And if you think of some trick you'd like 1-2-3 to perform but get stuck creating the program, write me and I'll try to help you in a future issue.)

Printing Without the Bother

The first macro makes 1-2-3 print without showing you a menu or dialog box and without printing a one-cell range. This second feat is noteworthy if you're using release 2.4 with the SmartIcons add-in, because clicking the printer icon causes 1-2-3 to print the current cell even when you haven't specified a print range or preselected a range. The macro tells 1-2-3 to print the currently selected range, if there is one, or the most recent print range if that exists. The macro version for releases 3.1+ and 3.4 prints the most recent print range or does nothing. Releases 3.1+ and 3.4 macros can't operate on a preselected range because starting a macro deselects the range. In all other versions, if there's an existing print range and a preselected range, the macro prints the preselected range and makes it the new print range.

The print utility macro in **FIGURE 1** works in releases 2.3 and 2.4 with Wysiwyg attached or in 1-2-3 for Windows release 1.*x*. This macro exploits a Wysiwyg feature that causes 1-2-3 to beep and display an error message if no print range is assigned. This is why I used Classic Wysiwyg commands instead of menu bar commands in 1-2-3/W. A macro that used {MB}FP would just print the one-cell range at the current cell pointer location if no print range were assigned. {ONERROR} lets the macro end "gracefully." The macro ends when there's no preselected range and no print range.

	A	B
1	\p	:PRS{BREAK}
2		{ONERROR no_range}
3		:PG
4	no_range	{BREAK}

FIGURE 1: PRINT THE RANGE without confirmation. This macro works in 2.x with Wysiwyg or in 1-2-3/W 1.x.

	A	B
1	\p	{ONERROR no_range}
2		:PG
3	no_range	{BREAK}

FIGURE 2: THE NO-PROMPT PRINT MACRO for release 3.x.

The macro doesn't really know if there's a print range or not. It starts by selecting the :Print•Range•Set command, then backs out of the menu with {BREAK}. These commands either assign the print range to a range you've highlighted, or leave the current print range, or the absence of a range, unchanged. Next, the macro issues the {ONERROR} command. If there isn't a print range, the macro ends. If there is a print range, the macro prints it.

You can use this macro in a worksheet or in a macro library in releases 2.3 and 2.4, but you can't use it in a SmartIcon in release 2.4 or 1-2-3/W.

FIGURE 2 shows the macro for releases 3.1+ and 3.4 with Wysiwyg attached. This version prints only if a print range exists. Otherwise, it stops.

The macro in **FIGURE 3** works in 1-2-3 release 4.0 for Windows. This release offers a number of ways for macros to know what's going on in the worksheet. For example, a macro can determine what the current print range is or, as you'll see later, it can tell whether recalculation is manual or automatic. This macro uses release 4.0's expression @ISRANGE(@@(@INFO ("print-range"))) to determine if a print range larger than one cell exists. If the result of this expression is 1 (true), the macro issues the command {PRINT} with no arguments. 1-2-3 prints the print range, unless you preselected a range, in which case it prints the selected range. {QUIT} keeps the macro from advancing to the second line in this case. If there's no print range, the macro uses @ISRANGE(@@(@INFO ("selection"))) to see if what's currently selected is larger than one cell. If it returns 1, the macro issues the command {PRINT "selection"}. Otherwise, the macro ends without printing anything.

1-2-3 release 4.0 for Windows offers a number of ways for utility macros to know what is happening in the worksheet.

If you want to create a SmartIcon that emulates this print utility macro, create a no-prompt print icon in release 4.0 by rendering the macro in Figure 3 as a

	A	B
1	\p	{IF @ISRANGE(@@(@INFO("print-range")))}{PRINT}{QUIT}
2		{IF @ISRANGE(@@(@INFO("selection")))}{PRINT "selection"}

FIGURE 3: RELEASE 4.0 MACROS can tell if there's a print range.

```
   A        B      C      D      E      F      G      H      I      J
1  \s       {PANELOFF}
2           {IF @CELLPOINTER("filename")<>""}/FS~R{QUIT}
3           {LET filenum,.0001}
4  nextfile {LET newfname,+"FILE"&@RIGHT(@STRING(filenum,4),4)}
5           {ONERROR nextavail}
6           {RECALC testfile}{testfile}
7           {LET filenum,filenum+.0001}{BRANCH nextfile}
8  nextavail/FS{newfname}
9
10 filenum
11 newfname
12
13 testfile     ERR
14
15 exist
```

FIGURE 4: THIS RELEASE 2.X FILE NAMING macro can be saved in a macro library file.

string-returning formula. Select *Tools•SmartIcons*, click *Edit Icon*, click *New Icon*, enter a file name, create the icon in the drawing area, and enter the following in the Enter Macro Here box:

@IF(@ISRANGE(@@(@INFO("print-range"))), "{PRINT}",@IF(@ISRANGE(@@(@INFO ("selection"))),"{PRINT ""selection""}",""))

Enter a description of the SmartIcon in the Description box, and click *OK*. Then add the icon to an icon set.

Auto File Naming in Release 2.x

If you're in the habit of quickly selecting /File•Save, pressing <Enter>, and typing r, you risk overwriting the first file in the current directory. Here's a macro that makes release 2.*x* behave like the Windows versions of 1-2-3, saving a file under its current name without a confirmation prompt. Furthermore, it proposes a file name, the first available in a series beginning with FILE0001, when you use it on a file that doesn't yet have a name. In this regard, it makes release 2.*x* emulate release 3.*x* and the Windows versions.

Use this macro in a macro library so that it will stay in memory as you work with different files. Enter the labels in **FIGURE 4** except the entry in B13. Select */Range•Name•Labels•Right* and specify range A1..A15. Then enter the following formula in cell B13:

+"{LET exist,<<"&newfname&">>A1}"

If necessary, attach the Macro Library Manager add-in. Then invoke Macro Manager, select *Save*, enter a file name, specify range A1..B15, and select *No* from the Use-Password menu. You use the *Worksheet•Erase* command to clear the worksheet. Then press **<Alt>-S** to run the macro. The prompt 'Enter name of file to save' followed by the current directory and the name FILE0001 appears. Press **<Enter>** to accept the name or press **<Backspace>** several times to delete it and enter another one.

If you press <Alt>-S again, 1-2-3 saves the file without prompting. If you erase the file, make some entries in a new file, and press <Alt>-S, the macro will propose FILE0001 or the next available name in the series.

Recalc-Mode Toggle

The next macro changes recalculation from manual to automatic or from automatic to manual. If you're using any version of 1-2-3 except release 4.0, enter the labels shown in **FIGURE 5**. Enter **+B6** in cell B7. If you're working in 1-2-3/W release 1.*x*, you can replace the command /WGRM in cell B3 with {MB}TU{ALT "R"}{ALT "M"}~{ESC} and you can replace the command /WGRA in cell B4 with {MB}TU{ALT "R"}{ALT "A"}~{ESC}. In either case, the tilde after the {LET} command is very important, because it refreshes the worksheet's formulas if 1-2-3 is in automatic-recalculation mode. (This is how the macro knows what mode to switch to.) In all releases, assign the labels in range A1..A7 as the names for the adjacent cells in column B.

If you're working in release 4.0, enter the labels shown in **FIGURE 6** and assign the name **\c** to cell B1.

To toggle between the two recalculation modes, press **<Alt>-C** (in 1-2-3/DOS) or **<Ctrl>-C** (in 1-2-3/W). You'll find that utility macros can make using 1-2-3 a bit easier and help you forgive its faults.

By Richard Cranford

```
   A      B      C      D      E      F
1  \c        {BLANK calcval}{RECALC calctest}
2            {LET calcval,1}~
3            {IF calctest}/WGRM{QUIT}
4            /WGRA
5
6  calcval
7  calctest      0
```

FIGURE 5: THIS MACRO switches between recalculation modes. It works in all releases except release 4.0.

Models on Disk includes the models and macros contained in this article. See page L19 for details. This is also available on PC World Online on America Online and CompuServe.

```
   A      B      C      D      E      F      G      H      I      J      K      L      M
1  \c     {IF @INFO("setup-recalculate")="manual"}{SET "setup-recalculate","automatic"}{QUIT}
2         {SET "setup-recalculate","manual"}
```

FIGURE 6: THIS RELEASE 4.0 TOGGLING MACRO uses an @INFO function to detect the worksheet's current calculation mode.

List @Functions and Macro Commands

Document @Functions and Macro Commands

Q Why doesn't 1-2-3 release 4.0 for Windows provide a comprehensive list of all the @functions and macro commands? I can't find one in the user's guide or anywhere on the help screen.
Laura Jennings, Cambridge, Massachusetts

A We don't know the reason for this, but Richard Cranford has written two small macros you can use to put a list of @functions and macro commands into a worksheet. After you run the macros, you can print complete lists of the commands.

```
   A          B   C   D   E
1  \m         {PANELOFF}{WINDOWSOFF}
2             {FOR mcount,0,426,1,getcmd}
3
4  mcount
5
6  getcmd     {{}{NAME}{TAB}{D mcount}~}~{D}
7
8
9  \f         {PANELOFF}{WINDOWSOFF}
10            {FOR fcount,0,228,1,getfunc}
11
12 fcount
13
14 getfunc @{NAME}{D fcount}~{EDIT}{HOME}'{D}
```

Enter the labels shown in the figure above in a new worksheet. Precede the entries in cells A1, A9, and B14 with apostrophes. Assign the labels in column A as range names for the adjacent cells in column B. (Note the apostrophe before the {D} at the end of cell B14.) Place the cell pointer in another column and run the first macro, \M. In a few minutes, you'll get a complete list of all the release 4.0 macro commands. Then move the cell pointer to another column and run the second macro, \F. You'll get a complete list of release 4.0 @functions with arguments.

If you would prefer to watch the macros run, omit the {PANELOFF}-{WINDOWSOFF} commands in the first line of each macro.

Shift to a Macro

Q I am a longtime 1-2-3 user and have grown accustomed to turning off <Num Lock> and pressing the <Shift> key along with a number on the keypad to enter a number. Then when I want to enter the number into the worksheet, I release the <Shift> key and press an arrow key on the keypad.

You can imagine my surprise when I found that 1-2-3 for Windows works in exactly the opposite fashion. You have to turn <Num Lock> on and hold down the <Shift> key when you want to use the arrow key. After 10 years of using 1-2-3, I find this convention awkward. Do you have any suggestions?
Gary Thompson, Charleston, West Virginia

A 1-2-3 for Windows releases 1.*x* and 4.0 follow the Windows convention of using the <Shift> key to anchor a range that you select by pressing the arrow keys. So you can't use the <Shift> key with the arrow keys for other purposes. You can, however, write a one-line macro that will move the cell pointer in any direction after you press <Enter>. To try it,

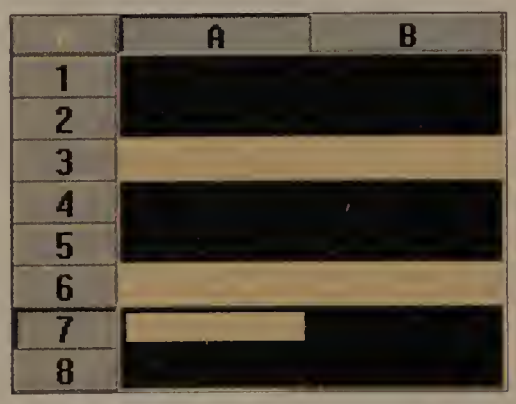
```
   A        B
1  \a       {?}{D}{BRANCH \a}
```

enter the text shown in the figure above and assign the label in cell A1 as the range name for cell B1.

To run the macro, move the cell pointer to an empty cell, hold down the **<Ctrl>** key, and press **A**. Type a number and press **<Enter>**. 1-2-3 will enter the data and move the cell pointer down one row. Repeat these steps to enter data in the column. When you've finished entering data, press **<Ctrl>-<Break>** to stop the macro. Then click *OK* or press **<Esc>**. If you want to make 1-2-3 move right, left, or up, replace the {D} with {R}, {L}, or {U}.

If you upgrade to release 4.0 for Windows, you can use the <Shift> key (with <Num Lock> off) and the arrow keys to select (or highlight) a range of cells. Then turn <Num Lock> on to begin entering numbers. When you enter a number, the cell pointer will automatically move down the highlighted column and then across to the top of the next column within the selected range. If you highlight a row, 1-2-3 will move across the row. If you have a mouse, you can use it with the <Ctrl> key to highlight multiple ranges (called a *collection*). Use the mouse to highlight the first range, then hold down the **<Ctrl>** key and use the mouse to highlight a second range, and so on. As you enter data and press **<Enter>**, 1-2-3 cycles through all the highlighted cells.

Note: 1-2-3 first enters data in the last range you highlighted because that's



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where the current cell is located. Then it cycles through the specified ranges—it enters data in the first range you specified, then in the second range, and so on. In the preceding figure, we selected ranges A1..B2, A4..B5, and then A7..B8. As we started typing, 1-2-3 entered data in cell A7, then in cells A8, B7, and B8, and finally in cell A1.

Generate Random Numbers

Q How do I generate six different random numbers between 1 and 50? I've tried several times, but I keep getting two or more of the same numbers.
Harold T. Rhodes, Dallas

A To generate random values within numeric intervals, multiply @RAND by the size of the interval. For example, enter **@RAND*50** in cell A1. 1-2-3 will return a number with up to five decimal places. To round the number, enter **@ROUND((@RAND*50),0)** instead. To extract just the integer, enter **@INT(@RAND*50)**.

If you're rounding the numbers or extracting their integer portions and restricting the numbers to a range, you may get duplicate numbers. One solution is to create a macro that generates a random number and then checks to see if that number already appears in a list. If the number is already there, the macro keeps running until it has generated a list of unique numbers.

To create the macro, enter the labels shown in the figure below. Assign the labels in range A2..A9 as range names for the adjacent cells in column B.

	A	B	C	D
1		Randno		
2	test	15		
3	counter	7		
4	integer	0		
5	same	1		
6				
7	\r	{FOR counter,1,6,1,random}~		
8				
9	random	{LET test,integer}~		
10		{IF same}{BRANCH random}		
11		{PUT randb,0,counter,test}		
12				
13		Randno		
14		6		
15		14		
16		3		
17		48		
18		2		
19		15		

Assign the name **Criteria** to range B1..B2, and assign the name **Randb** to range B13..B19. Your six random numbers will end up in the range named Randb. Finally, enter the formula **@INT(@RAND*50)** in cell B4, and enter the formula **@DCOUNT(randb,0,criteria)** in B5.

To test the macro, place the cell pointer in cell B14 and press **<Alt>-R** (**<Ctrl>-R** in 1-2-3 for Windows). The macro places the result of the formula in the cell named Integer into the cell named Test. Then it checks the result of the @DCOUNT formula in cell B5 to determine whether that value appears in Randb. If it does, the macro continues to generate numbers until the next unique number appears. Then the macro copies the unique value from the range named Test into the next available cell of the range named Randb and repeats the procedure until all the cells in Randb are filled.

To generate more random numbers, change the 6 in the FOR statement to the number you want, and expand range Randb to include additional cells.

Create Nested @IF Formulas

Q I need a formula that will calculate a loan payment only when the principal is more than $500. However, I don't want the loan balance ever to go below $500. Can I write a formula to ensure this? Currently, I enter the loan principal in cell A2 and enter the formula @IF(A2<500,0,A2*0.15) in cell B2. Then in cell C2 I enter the formula +A2-B2 to subtract the payment from the principal.
Jack Bouma, Winnipeg, Manitoba, Canada

A What you need is a nested @IF formula (also known as an "if-then-else" formula). Enter the following formula in cell B2 instead:

@IF(A2<500,0,@IF(A2-(A2*0.15)<500,A2-500,A2*0.15))

The term @IF(A2<500 determines whether the principal is less than $500. If it is, the formula returns a zero in cell B2. But if the principal is $500 or more, the term @IF(A2-(A2*0.15)<500 determines whether 15 percent of the principal, the payment, reduces the principal to less than $500. If it does, the A2-500 portion of the formula returns the difference between the principal and $500; if it doesn't, the A2*0.15 portion of the formula calculates the payment.

SITUATION: If the principal is less than $500,
ACTION: stop; don't calculate a loan payment.
SITUATION: If the principal is $500 or more,
ACTION: then calculate the loan payment and subtract it from the principal and continue to the next situation.
SITUATION: If the principal minus the loan payment is less than $500,
ACTION: then subtract $500 from the payment and use that result as the loan payment.
SITUATION: If the principal minus the payment is $500 or more,
ACTION: then use the calculated loan payment as the loan payment.

Before you write a nested @IF formula, it's a good idea to describe the situation on paper. Line up situations and actions that are alternatives to each other; indent each step you need to take to accomplish your task. The situation/action box in the figure above shows how indenting can clarify if-then-else situations.

Link Cells Within @Functions

Q I have followed the stock market for several years using two different worksheet files. The first tracks the prices for each stock I own; the second tracks the net worth of all the stocks. How do I link each stock in the net worth worksheet with its current price in the first worksheet?
Daniel Markey Jr., Charleston, South Carolina

A You need a linking formula, and to write a formula that contains a link to another file, you'll have to use 1-2-3 release 3.*x* or 1-2-3 for Windows release 1.*x* or release 4.0.

GOOD IDEAS

Clear the Circle

The circle SmartIcon in 1-2-3 releases 2.4 and 3.4 adds a circle to your worksheet, but there's no SmartIcon to remove it. The Delete icon and the Remove Wysiwyg Formatting icon won't work because the circle is a graphic image.

To remove the circle from the worksheet, select *:Graph•Remove* and specify the range that contains the circle.

Product Support Department, Lotus Development Corporation, Cambridge, Massachusetts

Start in a blank worksheet and enter the labels and values shown in the first figure below. If you're using 1-2-3/W release 4.0, enter the dates as shown. 1-2-3 will automatically format numbers entered in this manner as dates. If you're working in 1-2-3 release 3.*x*, enter the dates as shown, then select */Range•Format•Date•4* and specify range B2..F2. In 1-2-3/W release 1.*x*, select *Range•Format* and choose *4:Long Intl Date.*

	A	B	C	D	E	F
1	STOCK	Price on Date:				
2	NAME	02/07/94	02/08/94	02/09/94	02/10/94	02/11/94
3	CPL	29.25	29.625	30.25	36.5	30.125
4	ED	34	34	34.375	35	34.875

	A	B	C	D	E
1	STOCK	#OF	LATEST	NET	LAST
2	NAME	SHARES	PRICE	WORTH	DATE
3	CPL	100	30.125	3012.5	02/11/94
4	ED	10	34.875	348.75	

Assign the name **Daterow** to range B2..F2, and assign the name **Table** to range A2..F4. Save the file as **STOCK_1**.

Next, close the worksheet (in release 3.*x* select *Worksheet•Erase*) and create the second worksheet by entering the labels shown in column A and in rows 1 and 2 of the second figure. Enter **100** in cell B3, and enter **10** in cell B4 to represent the number of shares you own. Then assign the same date format you used in the file STOCK_1 to cell E3, and save the file as **STOCK_2**.

Then enter the following linking formula in cell E3 of STOCK_2, substituting your own drive, extension, and directory name:

@MAX(«C:\94JAN\QA\STOCK_1.WK4»DATEROW)

This formula finds the most recent date in the range named Daterow in the file named STOCK_1.

Now enter the following formula in cell C3 of STOCK_2:

@HLOOKUP(E3,«C:\94JAN\QA\STOCK_1.WK4»$TABLE,@CELL("row",A3)-2

This formula finds the current price of the stock that appears in the first row of the range named Table in the file STOCK_1. Copy this formula to C4.

Finally, enter the formula **+B3*C3** in cell D3 and copy it to cell D4 to calculate the current net worth of your stock. Then save the file again.

As you add dates and prices to STOCK_1, don't forget to expand the Daterow and Table ranges to include the new dates and prices. Also, if you're not working with both files in memory at the same time, you must select */File•Admin•Link Refresh* when you retrieve STOCK_2 so it displays the current data from STOCK_1. (In 1-2-3 for Windows release 1.*x*, select *File•Administration•Update•Links.* In release 4.0 for Windows, select *Edit•Links,* and select *File Links* from the drop-down menu. Click the *Update All* button, then click *Close.*)

Know Wysiwyg's Limits

Q My 1-2-3 worksheets contain many formats that were assigned with the Wysiwyg add-in. I have noticed that after a while, 1-2-3 no longer retains a requested format. Is there a limit to the number of Wysiwyg formats the program will let me create?

Alan Weinberger, Reston, Virginia

A 1-2-3 releases 2.*x* and 3.*x* with Wysiwyg and 1-2-3 for Windows release 1.*x* allow you to create up to 240 unique Wysiwyg formats that can be used an unlimited number of times in a worksheet. 1-2-3 release 4.0 for Windows allows up to 4000 unique formats per file if you save the file with the WK4 extension.

Instead of returning an error message when you've reached the 240-format limit, 1-2-3 release 3.*x* and 1-2-3/W release 1.*x* display either the default format or no format. Release 2.*x* returns an out-of-memory error message when you reach the limit.

If you have access to Lotus's CD/Prompt, download the file named ATTRIBUT.WK1. This worksheet file illustrates 240 different formats and lets you see what happens when you try to add one more in 1-2-3 releases 2.*x* and 3.*x* with Wysiwyg attached and in 1-2-3 for Windows release 1.*x*.

Do you have a question about Lotus products or a favorite technique for using them? Think you've found a bug in a recent release? Send your letters, including your address and daytime telephone number, to Q&A/Good Ideas, PC World Lotus Edition, *77 Franklin St. #300, Boston, MA 02110. We pay $60 for each letter we publish. Sorry, we cannot acknowledge unpublished materials.*

Models on Disk includes the models, macros, or formulas contained in this article. See page L19 for details. This material is also available from PC World Online on America Online and on CompuServe.

COMPLAINT LINE

Paint It Black

In 1-2-3 release 4.0 for Windows, if you select *Style•Worksheet Defaults* and check the box labeled *Negative Values in Red,* negative numbers in cells that haven't been assigned a specific format will appear in red. But if you assigned a format to a cell containing a negative number, the number won't appear in red. You can, of course, select *Style•Lines & Color* and check the box labeled *Negative Values in Red* to take care of that one cell. You can also reset the cell's format to the worksheet default.

A Smart Install for SmartSuite

Five best-of-breed Windows applications that work together seamlessly—that's the promise of Lotus SmartSuite for Windows. 1-2-3, Ami Pro, Freelance Graphics, Approach, and Organizer share more than SmartIcons and the live status bar. When they work together well, they can save you trouble with all those tasks that a single application just can't hack.

But they don't always work together the way you'd expect. Five different installation procedures and a few glitches among what are still essentially separate products can cause some problems.

Lotus promises a common installation routine for a CD ROM version of SmartSuite due sometime in 1994, and wrinkles in some of the applications will be ironed out in later releases. In the meantime, here's how to pull the various components of the Suite together into a harmonious whole.

Getting Started

Before you install the applications in Lotus SmartSuite, follow these five steps to prepare your computer:

1 Back up your files. Move your customized Ami Pro style sheets, Freelance SmartMasters, and SmartIcon palettes out of the program directories and into a temporary directory before you begin installing the Suite. (Ami Pro style sheets use an STY extension, Freelance SmartMasters use MAS, and SmartIcon palettes use SMI.) Also, if you store your applications and your work in the same directory, move your work files into a separate directory. Make a backup copy of any existing INI files too. When you install the new version of the Suite, it updates existing INI files. However, you should always back up for safekeeping.

2 Delete old applications. Unless you have a lot of free disk space, you'll need to delete the previous versions of the Suite applications from your hard disk to make room for the new products. (Just make sure that the program you're installing is a complete program, not an upgrade). Deleting your old applications is a good idea anyway, because installing a new program doesn't always delete files that are no longer needed.

3 Optimize your hard disk. As the hard disk fills up with information, files become fragmented—that is, split into pieces and stored in various locations on the disk. The files are still complete, but you'll notice that it takes longer to save and retrieve them. After deleting the old applications, defragment your hard disk with a disk management program like The Norton Utilities.

4 Reset your swap file. Once you've defragmented your hard disk, reset your Windows swap file to take advantage of the freed space. The swap file should be at least as large as your system memory. If you have a 4MB system, for example, you'll need a 4MB swap file.

5 Check your CONFIG.SYS file. Finally, make sure that your CONFIG.SYS file contains a statement that starts the DOS Share program: **INSTALL=C:\DOS\SHARE.EXE**. The Share program allocates space for file sharing information and helps DOS keep track of open files.

If the statement isn't in your CONFIG.SYS file, back up the file, add the statement, then reboot your system.

Installing SmartSuite Locally

The first application you install creates a directory named LOTUSAPP. This directory stores all the files the Suite shares—the Spell Checker, Dialog Editor, DataLens drivers, import filters, multimedia files, and your Notes and cc:Mail user name. As you install each additional application, make sure that LOTUSAPP is correctly identified. (If you're currently using a Lotus product, this directory may already exist. If it does, you don't need to take any action; the install procedure will write to and update common files as needed.)

You can begin the SmartSuite installation with any product except Ami Pro. The Ami Pro disks do not contain the programs that are needed to create the LOTUSAPP directory and the shared files. This problem will be fixed in the next release of Ami Pro.

While the interface of each application's install program differs slightly, the information you supply is basically the same. You specify your name and company, the drive and directory where the program will be stored, and the type of installation—either default or custom.

If you select the default install option, you get all the application's features

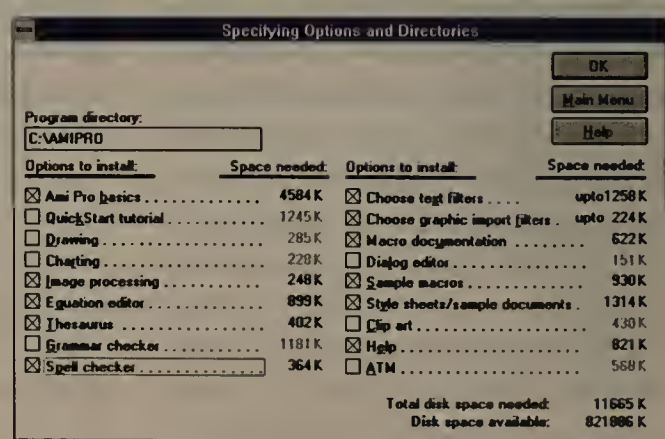

FIGURE 1: A CUSTOMIZED INSTALL option allows you to install only those features you need.

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(except for a few DataLens drivers in 1-2-3). If you select a custom install, you can elect not to install such features as the tutorials, guided tours, and sample files (see **FIGURE 1**). You can add them later, though. If you're new to SmartSuite, select the default option to make sure you get all the files.

1-2-3: If you need to install additional DataLens drivers (dBASE is the default selection), select the *Customized Install* option and click the *Select* button to the left of the DataLens Drivers option. When the DataLens Drivers dialog box appears, select the drivers you need and click *OK*. Click *OK* again in the Customized Install dialog box to start the installation. (Because dBASE is an industry standard, we recommend that you always install the dBASE driver.)

Ami Pro: Select the *Complete Ami Pro Install* option for Ami Pro and follow the prompts. Once you've installed Ami Pro, you can install the Working Together Bonus Pack, a series of Ami Pro macros that integrate Ami Pro with the other Suite applications as well as with other Lotus products.

Freelance Graphics: This application ships with features you may never use: Lotus Annotator, Lotus Media Manager, and Lotus Sound add sound and video to your presentations, and the Autographix Slide Service creates color PostScript print files that you can send to an Autographix service center for processing. If saving space is a top priority, select *Install with Options* and leave those options deselected.

Approach: Select the *Full Installation* option. If you're pressed for disk space, use the *Custom Installation* option and select only those power keys for which you have an immediate use. Another way to save space is to install only one set of sample templates. For example, if you work in a small-business environment, click *Template Options* and deselect *Large Business Templates.*

Organizer: The Organizer installation is the easiest of the Suite because the entire program resides on a single disk. To install Organizer, just insert the disk, select *File•Run*, and type **Install**, and Organizer takes care of the rest.

When you've completed installing the Suite, a program group similar to the one that's shown in **FIGURE 2** is added to your Windows desktop.

Installing SmartSuite on a Network

To install the Suite on a network, you must have access to a network drive and understand how that drive operates.

When you install SmartSuite on a network, you automatically create two additional directories: LICENSER, which sets up your licenses, and LOTSHARE, which tracks all the licenses. LOTSHARE contains a separate subdirectory for each application in the Suite (except Organizer). The files in these subdirectories reflect your license agreement with Lotus and control the number of people who can use each application. **FIGURE 3** shows a network directory structure in which the LOTSHARE and LICENSER directories are in the root of the network drive. You should follow a similar structure when installing the Suite.

For each product, you'll be asked to specify the location of these directories. For the LOTSHARE and LICENSER directories you should choose a drive not accessible to end users. As you install each product, make sure you indicate the same drive and directory. As in the local installation of the Suite, you should begin the network installation procedure with any product except Ami Pro.

1-2-3: Select *Install 1-2-3* from the Main Menu dialog box, and then choose *Customized Install.* Next, in the Customized Install dialog box, make sure you deselect the Adobe Type Manager option. Otherwise you will be prompted to insert disk 6, which isn't included in the Suite. According to Lotus Development, this glitch will be fixed in a subsequent release.

Ami Pro: Select *Install Ami Pro on Server* in the Main Menu dialog box, and select *Complete Ami Pro Install.*

Freelance Graphics: Select *Install Freelance Graphics on Server* in the Main Menu dialog box. Then select *Server Installation* in the Type of Installation dialog box. Make sure that the Adobe Type Manager option in the Specifying Drives and Directories box is deselected.

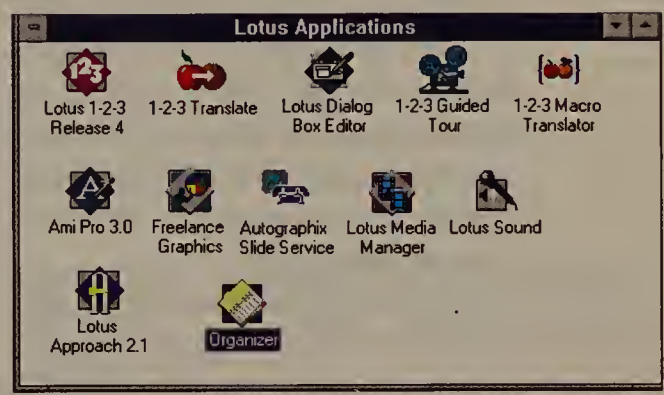

FIGURE 2: THE LOTUS APPLICATION GROUP contains all the program icons for SmartSuite.

Organizer: Select *Install a multi-user copy of the Organizer on a file server* in the Installation dialog box.

Approach: Select *File•Run* from the Windows Program Manager, type **A:\INSTALL /n** in the Command Line text box, and click *OK* to begin the installation.

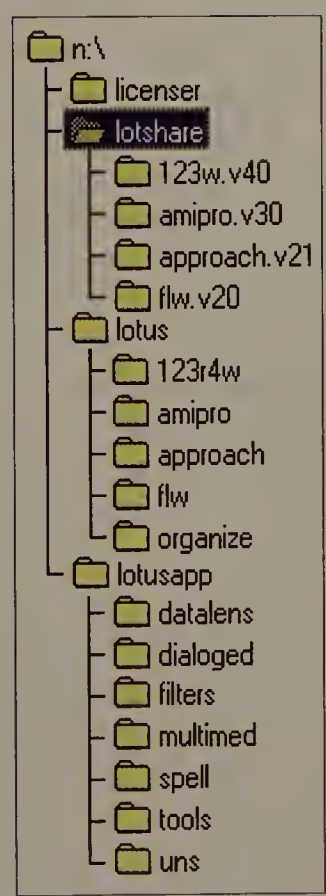

FIGURE 3: CREATE THE LOTUSAPP, LOTSHARE, and LICENSER directories in the root of the network drive for consistency.

Installing SmartSuite on Network Nodes

Once you've installed the Suite on the network, the next step is to install the products on each user's workstation, or node. In this step, you copy only certain files, like the SmartIcon files, to the workstation.

1-2-3: Select *File•Run* from the Windows Program Manager. Enter **N:\123R4W\INSTALL.EXE** in the Command Line text box. (Replace N: with the letter of your network drive.)

Ami Pro: Select *File•Run* from the Windows Program Manager, and enter **N:\AMIPRO\NODE\NODE.EXE** in the Command Line text box. (Replace N: with the letter of your network drive.)

You will be prompted to enter the location of the Ami Pro directory on the network. (This will probably be N:\AMIPRO.) Then you'll be asked to specify user directories for the macro, document, and style sheet directories. You'll also be asked to specify the location of the user dictionary directory. Enter **N:\LOTUSAPP\SPELL**.

Freelance Graphics: Select *File•Run* from the Windows Program Manager, and enter **N:\FLW\INSTALL.EXE** in the Command Line text box. (Replace N: with the letter of your network drive.)

Approach: Select *File•Run* from the Windows Program Manager, and enter **N:\APPROACH\INSTALL.EXE** in the Command Line text box. (Replace N: with the letter of your network drive.)

Organizer 1.1: Select *File•Run* from the Windows Program Manager and enter **N:\ORGANIZE\WORKSTN.EXE** in the Command Line text box. (Replace N: with the letter of your network drive.) Select *Use a public copy of the Organizer stored on the server.*

Adobe Type Manager: Install Adobe Type Manager on the user's local workstation. (Note that this step is not required. You don't have to install ATM if you don't need the fonts.) After installing ATM, you'll have to reboot Windows for it to take effect.

The forthcoming SmartSuite installation procedure should eliminate most of the present problems and concerns. Until then, these guidelines will help to smooth your way.

By Andrea Powers

Special thanks to Nancy Cronin of Lotus Development Corporation for her help in preparing this article.

Five Troubleshooting Tips

If you're having problems getting your applications to work together as advertised, here's a list of things to check:

1 Make sure you have the latest COMMDLG.DLL file. If you are having trouble using the File•Open command in any of the SmartSuite applications, you've probably been using an older version of the Windows COMMDLG.DLL file.

To ensure that you have the most recent DLL file, go to the Windows File Manager, click on drive *C:*, and select *File•Search* from the menu. Enter the name **COMMDLG.DLL** in the Search For box, and enter **C:** in the Start From box. Select *Search All Subdirectories* and click *OK*.

In the Search Results window, find the reference to the C:\WINDOWS\SYSTEM\COMMDLG.DLL file. The file size should be 89248 bytes, and the file date should be 3/10/92 or 3/23/92. If your file has a different size or date, delete it and add the new one as follows. If you find more than one file, keep the one in the \WINDOWS\SYSTEM directory and replace any of the other files.

You'll find the latest DLL file on disk 4 of your Windows 3.1 disks. This file is compressed, so you'll have to run the Expand program to decompress it. First, exit Windows and switch to the WINDOWS directory. Insert disk 4 in drive A: or drive B: and enter **EXPAND A:\COMMDLG.DLL C:\WINDOWS\SYSTEM**.

2 Point your LOTUS.INI file in the right direction. The file named LOTUS.INI tells Windows where to find the SmartSuite applications, and it tells those applications where to find the LOTUSAPP directory. If your applications won't run or you can't use features like the spelling checker, make sure LOTUS.INI points them to the right place.

For example, if you move a Suite application from one directory to another, you'll have to edit the LOTUS.INI file so that it knows the new drive or directory. Use Windows' Notepad accessory or use your favorite text editor to edit the file.

As always, before you edit an INI file, back it up. Then you can revert to the original INI if things go wrong.

3 Tell Ami Pro where to find applications. Each of the products in the Suite, with the exception of Approach, contains a set of Working Together SmartIcons that allow you to launch other applications in the Suite. However, in Ami Pro, the macros that launch the applications look for each executable file on drive C: and in the default subdirectory of the program you're launching. If Ami Pro cannot find the application, you'll be asked to select the correct path in the Find Application dialog box. (If you've installed the Ami Pro Bonus Pack, you can use the Application Manager instead. The macros that are attached to these icons refer to the LOTUS.INI file, so you'll be able to launch an application no matter where it is.)

4 Check which programs are active. The Working Together SmartIcons make it easy to launch any application in the Suite, but overusing them can sometimes cause you trouble. Some of the products, Ami Pro in particular, allow you to open multiple copies of a single application, which can really tax your system memory. Instead of using the Working Together SmartIcons to launch another application, use the Windows Task Manager to switch between applications.

5 Tell SmartSuite where to find your work. Once you've installed all the applications in the Suite, define a user directory so the programs know where to find your work. In 1-2-3, Freelance, and Ami Pro, just select *Tools•User Setup* and take it from there.

In Approach, you establish your user directory from the Windows Program Manager. Select the Approach icon, select *File•Properties*, enter the name of your working directory, and click *OK*.

Tricks for Importing 1-2-3 Data

Just about every Improv user needs to import data from 1-2-3 or another conventional spreadsheet at some point. Before you import a 1-2-3 worksheet, try to make it look as much like an Improv model as possible. Then save the 1-2-3 worksheet with a new name to keep the original file intact. Finally, close the worksheet in 1-2-3 so that Improv can import it.

Clean Up 1-2-3 Worksheet Design

Improv can't import any of the formatting you use in 1-2-3 to make your worksheets easier to read. It takes raw data only. Here's a list of things to do before importing a 1-2-3 worksheet:

1. Delete titles, subtitles, and other extraneous text.
2. Delete rows with repeating characters—for example, \-.
3. Delete empty rows or columns.
4. Delete macros in the worksheet; you can't use them in Improv.
5. Make sure that each column and row label occupies only one cell.
6. Display hidden data. Hidden data is imported, but how much of it remains hidden will vary, so import it all and then hide it again in Improv.
7. If you're importing a WK4 file with more than one version of a range, display the version you want to import.
8. Rewrite formulas so they refer only to those cells that contain data, not to blank cells. Otherwise, Improv will create unnecessary rows and columns.
9. If you're importing a 1-2-3/W file, assign the Arial 9 font to all cells.

Streamline 1-2-3 Worksheet Layout

The more a 1-2-3 worksheet resembles an Improv sheet, the easier it will be to import. Here's what to do:

1. If you're importing the whole 1-2-3 worksheet, move the data into the worksheet's upper left corner. Column labels should appear in row 1, and row labels should appear in column A. Cell A1 should be blank.
2. If the data is arranged in separate areas on one worksheet—an arrangement common in 2-D worksheets—you should import the data area by area, so make sure that all cells are within a named range. (A worksheet in which the data is entered in one range and a macro resides in another range is an example of a worksheet with data in two separate areas.)
3. If any named ranges overlap, create a new named range that contains both of the overlapping ranges, and import that one range.
4. If the worksheet contains repeating labels, like those in cells A3 and A7 and in cells A4 and A8 in **FIGURE 1**, import each set of labels as a range—for example, North and South.
5. Importing 3-D worksheets is easy if all the sheets have the same row-and-column structure and each sheet has only one area of data. When you import the 3-D file into Improv, each sheet will appear as a separate page of a single worksheet. Improv will create a category named Page to identify the data that belongs to each sheet.
6. Importing 3-D worksheets whose individual sheets have different structures does not work well. Suppose you have a multisheet budget file. Sheets A through G contain data from seven different departments in your company, and all seven sheets have the same lay-

	A	B	C	D
1		Jan	Feb	Total
2	North			
3	Chairs	$650	$570	$1,220
4	Tables	$430	$560	$990
5	Total	$1,080	$1,130	$2,210
6	South			
7	Chairs	$560	$550	$1,110
8	Tables	$650	$660	$1,310
9	Total	$1,210	$1,210	$2,420
10				

FIGURE 1: ASSIGN RANGE NAMES to different areas with repeating labels. For example, assign the name North to A2..D5 and the name South to A6..D9.

Import 1-2-3 Worksheet Data the Right Way

DIMENSIONS	DATA AREAS	LABELS	SHEET STRUCTURE	ACTION
2	1	unique	—	Move the data into the upper left corner. Import the whole worksheet. Create item names from labels.
2	1	repeat	—	Assign range names to each area and import ranges. Don't create item names from labels.
2	> 1	—	—	Same as above.
3	1	—	same	Move the data into the upper left corners of each sheet. Import the entire worksheet. Create item names from labels.
3	—	—	different	Assign range names to data areas and Import range name by range name. Don't create item names from labels.

out. However, sheet H, in which you compare the total of these budgets to last year's actual results, has a different layout. If you import this file directly into an Improv file, you'll get a jumble of data. There is a work-around, however. You can assign a range name to each sheet and import sheets A through G into one Improv file and import sheet H into another file. Then write formulas that link that file to the other.

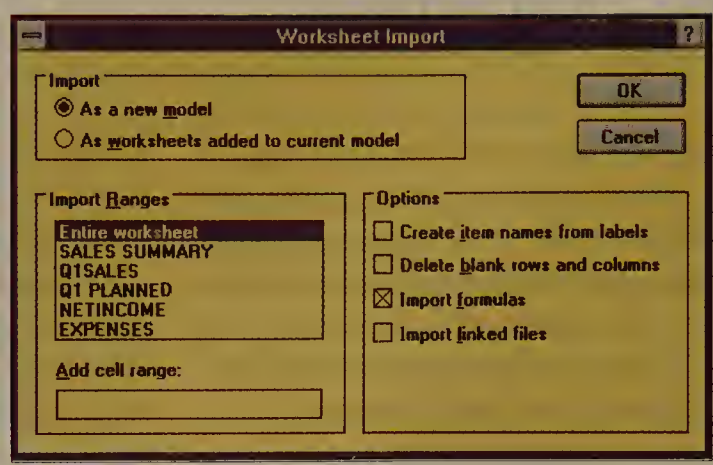

FIGURE 2: OPTIMIZE YOUR RESULTS by selecting the right options from the Worksheet Import dialog box.

Your Import Options

To begin the import process in Improv, select *File•Open*, select a 1-2-3 file extension (WK1, WK3, or WK4), specify a file name, and click *OK*. Improv will open the Worksheet Import dialog box shown in **FIGURE 2**. Use this dialog box to control the import process.

Your first choice is whether to import the worksheet as a new model or as an addition to the current model. The first time you import a worksheet, you should import it as a new model and see what the results are.

Next, choose whether to import ranges or the entire worksheet. Importing a simple 2-D worksheet is easiest. Importing worksheets in which the data is in different areas of the worksheet also works quite well if each area has a range name; you can bring each range into a separate worksheet in the model.

There are a few other import options:

Create item names from labels. Generally, select this option under the conditions described in "Import 1-2-3 Worksheet Data the Right Way." The simpler the worksheet structure, the more likely it is that you will get properly identified items.

Delete blank rows and columns. This clears any blank areas above and to the left of the data in a worksheet. If you've already moved data to the upper left corner, you can ignore this setting.

Import formulas. Unless you want to re-create all the formulas, select this option. Improv translates 1-2-3's cell-based formulas into general ones. It translates formulas pretty well. You'll need to check the formulas and fix any that Improv marks as broken (with formula status indicators). Note: Test each formula that comes into Improv to be sure you get the desired results.

Import linked files. This option imports a linked file as a separate worksheet in the model. Clean up the linked file before you import.

Completing the Improvisation

Once the data is in Improv, Improvize it even further.

1. Delete blank items or items that contain irrelevant data.
2. Resize rows and columns so that the data is displayed properly.
3. Rename the categories and, if necessary, the items. As you rename categories and items, you'll notice that the formulas begin to read like English.
4. Create groups where appropriate. Once you create groups, you can replace formulas for those groups with Improv's group formulas.
5. Correct formulas with Error, Mismatched, or Unlinked indicators.
6. Rewrite commented formulas—for example, formulas that contain unsupported @functions.
7. Check formula priorities to make sure that formulas are calculated in the correct order.
8. Use the Browser to rename the worksheets if necessary.
9. Re-create charts and reformat the data as you like.
10. Finally, arrange the view and create additional views.

By Christie Williams

Christie Williams is a freelance writer in Boston.

Should You Be Importing at All?

Before you import 1-2-3 data into Improv, consider whether you should use copy and paste or use Dynamic Data Exchange (DDE) links instead.

Copying and pasting between 1-2-3 and Improv may be the best option if your primary concern is getting raw data into Improv. This method copies the value of a cell rather than the formula, so you'll have to re-create formulas once the data is in Improv. Open 1-2-3 and then Improv, highlight a section of your 1-2-3 data, and select *Edit • Copy*. Next, go to Improv, and select *File • New*. Create enough cells to contain the data, and then select *Edit • Paste*.

A big benefit of pasting into Improv is that you can design the Improv model as you go. You'll get a real Improv model rather than a 1-2-3/Improv hybrid.

If you need up-to-date information, create a DDE link to the 1-2-3 worksheet. It's a good choice when your main concern is using the current data for new analysis and presentation rather than repeating the calculations and analysis that were accomplished in the 1-2-3 worksheet.

For example, you could copy current sales figures from a 1-2-3 worksheet and link the data into Improv: Select *File • New*, then select *Edit • Paste Special* and click the *Link* button to link the data into Improv. Then use Improv to present the data in different ways. Remember, though, you must create enough empty Improv cells before you link, and the source file must have been saved before you can link data from it. Also remember to highlight all the cells you wish to link to if you're linking from 1-2-3 to Improv.

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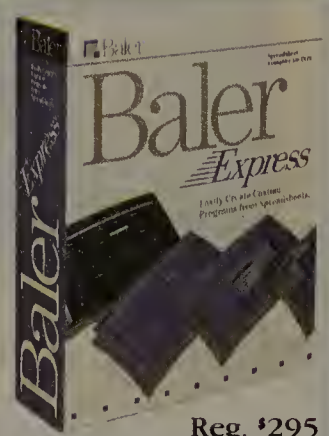

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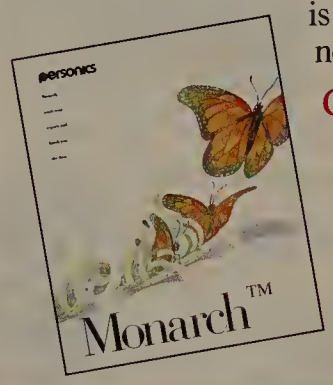

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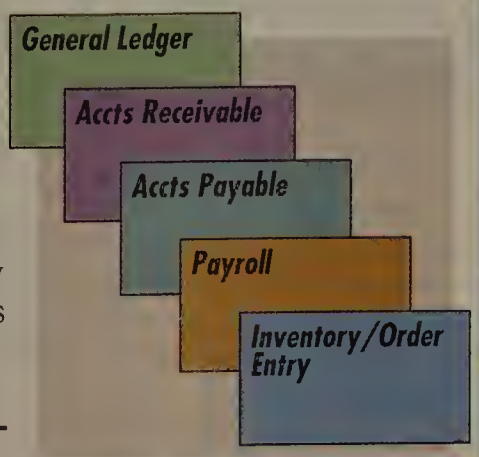

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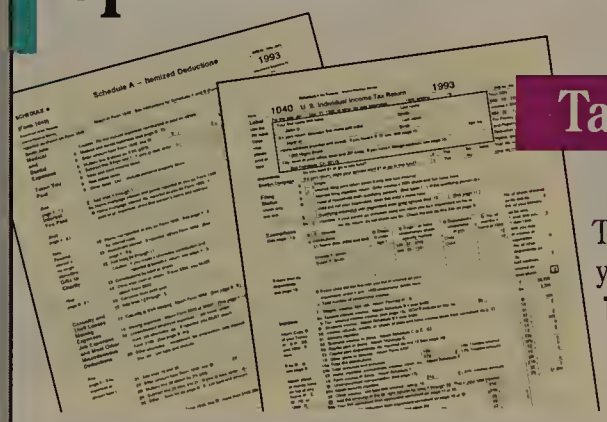

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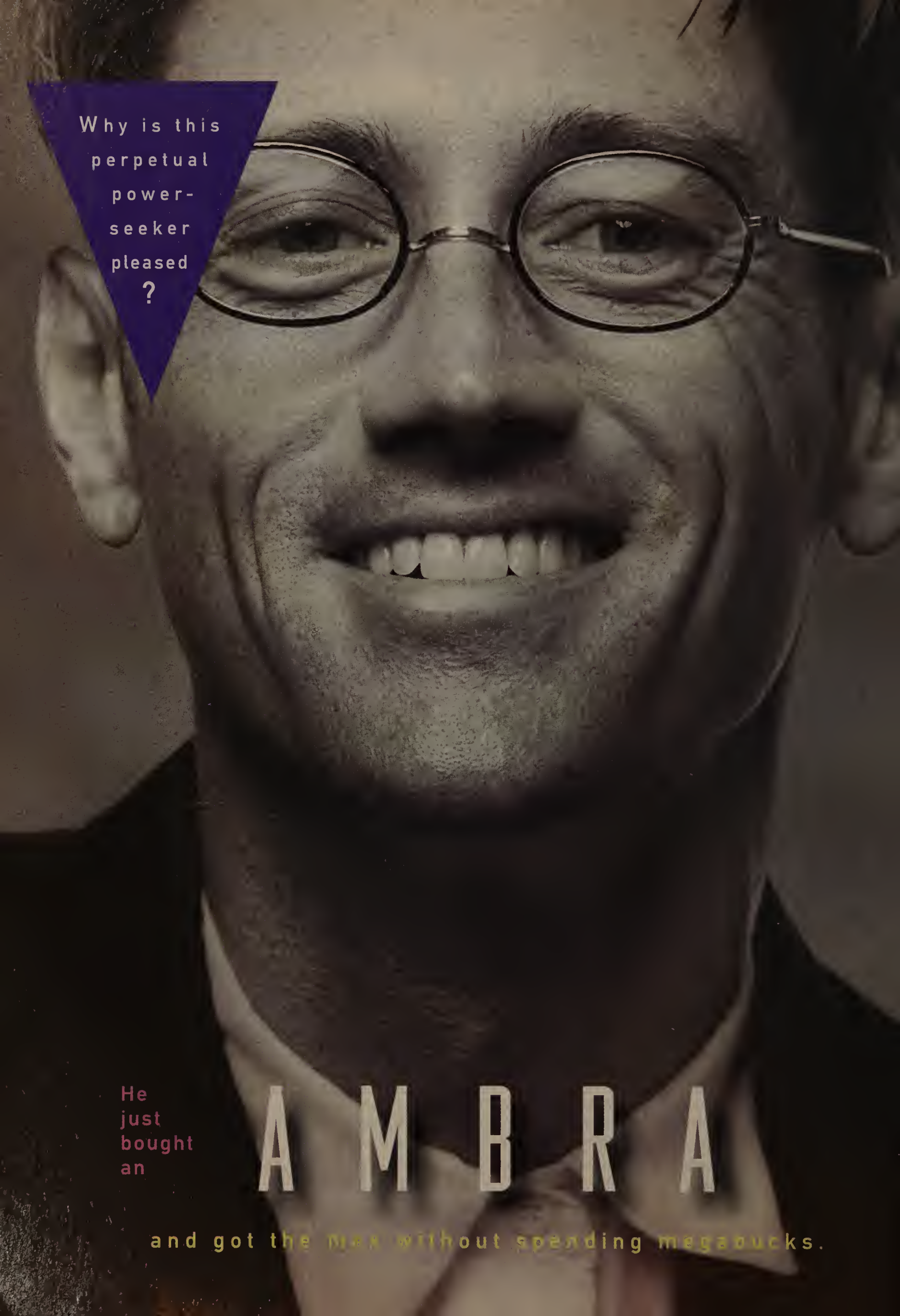
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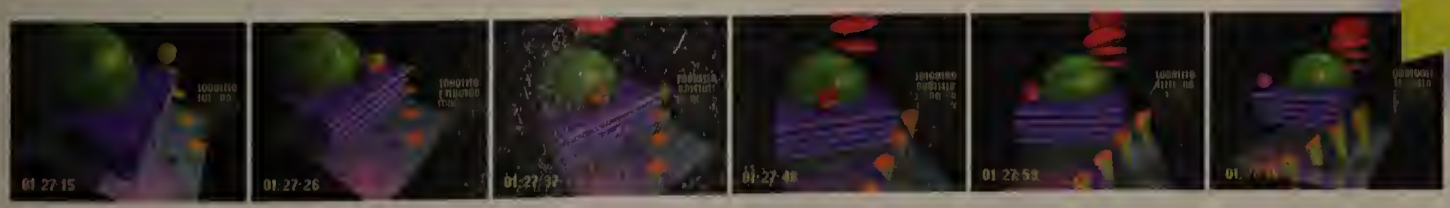

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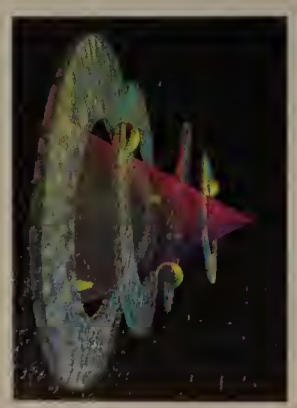

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- 200-watt power supply
- MS-DOS® 6.0, Windows 3.1, mouse

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4 Model TP60E/VL[3]

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- Dual 64-bit processor complex
- 8MB RAM, max: 128MB
- 512KB processor cache
- 3.5" 1.44MB diskette drive
- 540MB (10.5ms) Fast SCSI-2 hard disk
- Onboard dual-channel Fast SCSI-2
- 8 EISA slots (2 VESA)
- 12 storage bays
- L25 S3 805 graphics accelerator, 1MB DRAM
- 2X CD-ROM drive
- 15" Flat Square color monitor, LR, NI
- Tower casing
- 350-watt power supply
- MS-DOS® 6.0, Windows 3.1, mouse

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Circle 127 on reader service card

THE BEST BUY PCs in this superfast company range from the robust $4999 Pentium IBM ValuePoint P60/D to the inexpensive $2385 Netis N4D266VL 486DX2-66.

PCs for the Power Hungry

Pentiums vs. 486DX2-66s

Compared to top-of-the-line 486DX2-66s, are Pentiums good values or overpriced? That's the question we ask this month when reviewing the first 60-MHz Pentiums and the fastest 486 PCs.

STAN MUSILEK

By Rex Farrance

Admit it—all those recycled paper clips and file folders aren't just for the environmental effort. You're saving your pennies, aren't you. Feeding that secret fantasy of owning the ultimate in hot, *expensive* desktop iron. If your fantasies are anything like ours, you're envisioning a powerhouse loaded with the RAM and storage to handle Windows NT, OS/2, and other demanding graphical applications. You've heard all the promises about Pentium power. The question is, can you afford the price? And are Pentiums worth the extra cost? Well, yesterday's fantasies have just materialized into some of today's best deals.

To see what kind of machinery you can find at the high end, we set out to review business offerings from a double-dozen prominent vendors. Of course we specified high-performance computers. And we got them: Acer, ALR, Compaq, and IBM PC Company sent us four of the first available 60-MHz Intel Pentium PCs. Twenty other vendors sent 486DX2-66s—the pre-Pentium top-dog performers. Ironically, the lowest-power PC in our roundup came from the

Testing by Ulrike Diehlmann and Susan Silvius; research and support by Dawn Furseth

same vendor that provided the fastest Pentium—ALR. It delivered the sole DX2-50.

Clearly, vendors are facing up to power users' needs. No machine came with less than 8MB of RAM, and almost half came with the 16MB needed to run Windows NT. Today's graphical applications put the pinch on disk storage, and system vendors have responded by beefing up the standards. Only four companies sent hard disks smaller than 340MB, and more than half the systems came with 400MB or more of storage. Unisys's model came with a humongous 1.2GB SCSI drive!

Pentium Power

Considering the muscular configurations, we expected great performance, and we weren't disappointed: This group of systems recorded better benchmarks than any PC group we've seen. Only five of the systems ran significantly slower than our 486DX2-66 historical average, and one of them was the DX2-50. The new 60-MHz Pentiums were the fastest machines by far, outrunning all the 486s. ALR's Evolution V—the speed leader—ran our benchmarks about 35 percent faster overall than our quickest DX2-66 and 50 percent faster than the average. As we had expected, the Pentiums clustered in a bunch at the top of the chart.

But Pentiums still cost too much for everyday business, right? That depends on whose Pentium you buy. The ALR Evolution V and the Best Buy IBM ValuePoint P60/D come in around $5000 each—not bad for your ultimate powerhouse. But if you still feel you can't afford Pentium, the 486DX2s provide a lower-cost alternative. The price dips below $2000 on the least expensive system here—Blackship's BLK 486/66LB. And three of our five 486DX2-66 Best Buys cost less than $3000, while the other two are priced around $3300.

Best Buys

Sure, you expect a Pentium to blow away a 486 when it comes to performance—but you'd also expect this kind of brand-new technology to carry a prohibitive price. Fortunately, today's buying climate has convinced vendors like IBM to pack their hot new Pentium PCs full of cool value. In IBM's case, such diligence was rewarded with the first Best Buy we've awarded to a Pentium PC.

1. **Netis N4D266VL** *pg. 146*
2. **Zeos 486DX2-66** *pg. 148*
3. **Comtrade EISA VL-Bus Professional 66** *pg. 140*
4. **Dell Dimension 466V/XPS** *pg. 141*, **Gateway 2000 4DX2-66V** *pg. 142*, **IBM ValuePoint P60/D** *pg. 142*

CLOCKWISE FROM TOP LEFT: Netis N4D266VL, Zeos 486DX2-66, Comtrade EISA VL-Bus Professional 66, Dell Dimension 466V/XPS, Gateway 2000 4DX2-66V, and IBM ValuePoint P60/D.

A late note on price: As this issue went to press, several vendors reported significant price reductions. The Acer and ALR Pentium models, for example, dropped to $5395 and $4955, respectively. So if a particular PC is high on your wish list but appears to be priced out of reach, don't despair. It's worth calling to see if the machine is now available at your price point.

More Pentiums Coming—For Less

If your heart is set on Pentium even though you can't afford $5000, be of good cheer: You may have your 64 bits' worth sooner than you think. Too late for this review, Gateway 2000 hit the market with its P5-60 systems. With 8MB of RAM, a 424MB hard disk, and a 14-inch monitor, a P5-60 is direct-priced at just $2995; with 16MB of RAM, a 528MB hard disk, and a 17-inch monitor, it costs $3995. In addition, Ambra, Compaq, and Dell were announcing affordable Pentium models as this article went to press.

We'll bet that this sighting is just the tip of the Pentium iceberg. Expect prices to drop on the early Pentiums reviewed here, and keep an eye out for competitively priced models from other major vendors. You'll continue to pay a premium over 486DX2s, both for the current 60-MHz Pentium models and for the 66s to come. But the gap between this next-generation processor and the 486DX2 is already narrowing. In addition, as Pentium production ramps up, you'll see DX2 prices drop below even today's affordable levels.

New Fast Processors Coming

Intel will toss its next card on the table soon after you read this—the new clock-tripled 486 CPU that will process at an impressive 100 MHz. Like DX2 processors, this CPU will communicate with secondary cache, system RAM, and mass storage at the 33-MHz clock speed of the motherboard. Expect to see this processor appearing in systems from major vendors in the first half of 1994.

IBM is playing its new gambit even before Intel's next CPUs arrive. The company's Blue Lightning is already available in a 66-MHz clock-doubled version. In addition, 75-MHz and 99-MHz clock-tripled versions will hit the market soon, with the 75 MHz representing IBM's first bet. So within six months, expect to see another showdown for the high-performance crown.

Major Vendors Flex Their Muscles

In this review of high-end performance PCs, familiar names surge to the head of the pack. Dell, Gateway 2000, IBM, and Zeos nail down four of six Best Buys, and NEC just misses. When you think about it, that's not too surprising. We're talking about power equipment, and these vendors made their names with top-end designs. So it stands to reason that in the current competitive environment, these giants would trim profit margins and take a hard look at what customers need.

Top-tier vendors usually generate their own designs and either manufacture their own motherboards or have them produced to spec. Smaller vendors, on the other hand, tend to buy off-the-shelf components and assemble their PCs. Even the biggest vendors, however, leave the manufacture of hard and floppy drives (and often the video components) to specialist companies.

The advantages of designing a system from the ground up become evident when you pop the top off a PC case. Machines from first-line companies generally have neater interiors—well laid out with easy access to RAM, secondary cache, expansion slots, and storage bays. Cables and wires are bundled neatly out of the way. Smaller manufacturers rarely compete well when it comes to accessibility and aesthetics.

Cost is another matter. Generally speaking, you'll pay extra for top design—and for many buyers, the difference is well worthwhile. The price gap has narrowed dramatically over the last couple of years, but it's still significant to dollar-conscious buyers.

Designing for Expandability

We've come a long way from the days when 2MB of RAM was the high-performance computing standard. But many motherboards still employ the same 30-pin sockets and single in-line memory modules (SIMMs) that were in vogue when the first standard SIMMs appeared. A PC whose motherboard uses these older sockets almost always has two banks of four sockets. Each bank must be filled with SIMMs of the same capacity. That means the sockets of an 8MB system will be filled with 1MB SIMMs. To upgrade, you have to discard four 1MB SIMMs and add four 4MB SIMMs. That gives you 20MB of RAM in your system and 4MB in your hand.

The newer 72-pin SIMM sockets don't impose the same limitation. An 8MB system will usually have two 4MB SIMMs or one double-sided 8MB SIMM. In either case, more sockets remain free for expansion. And there's no need to fill sockets in groups. Since 4MB, 8MB, and 16MB 72-pin SIMMs are all easily available *and* you can ordinarily mix and match capacities, these newer sockets give you unparalleled flexibility, limited only by the configurations the motherboard supports. If you're a power user, however, you'll want to buy your system with high-capacity SIMMs that leave sockets free for expansion.

The systems in this review broke about even on 30- versus 72-pin memory; two-thirds of the 30-pin systems had all their SIMM sockets filled. All else being equal, we prefer systems with the 72-pin setup. And we suggest you never buy a 30-pin system in an 8MB configuration unless you plan never to upgrade memory. Buy 16MB instead: You'll have more RAM to begin with, plus four sockets waiting for you to add even more later. We anticipate that motherboards with 30-pin sockets will disappear from the market over the next year or so, although you'll still be able to buy 30-pin SIMMs. A

Best Performance

No surprises here. The Pentiums really do the job, claiming positions one through four. The top-rated ALR outran the speedy NEC Image 466es (the fastest of 20 DX2-66s) by an impressive 35 percent! 486DX2-66 speedsters from Gateway, Zeos, National MicroComputers, and Acma just missed this list.

1. **ALR Evolution V** *pg. 136*
2. **IBM PC Company ValuePoint P60/D** *pg. 142*
3. **Compaq Deskpro 5/60M Model 510/1020/w** *pg. 150*
4. **AcerPower Series 9000** *pg. 134*
5. **NEC Image 466es** *pg. 146*

Best Price

No Pentiums on this list, but a few surprises. Blackship's DX2-66 is direct-priced at an astounding $1995! And the most expensive models on this short list—the Diamond and Insight—cost a mere $2799. Not bad for top-end equipment.

1. **Blackship BLK 486/66LB** *pg. 140*
2. **Netis N4D266VL** *pg. 146*
3. **CAF Master L737 DX2/66** *pg. 150*
4. **Tagram Concerto Hi-Note 486DX2-66** *pg. 148*
5. **Diamond DT 486DX2-66 VL-SCSI** *pg. 141*, **Insight 486DX2-66 Smart Server** *pg. 143*

Best Service and Support

Long warranties are the story: 36 months from Compaq and NCR; 24 months from Tagram; and 24 months parts, 60 months labor from Polywell. Responsiveness counts too: Buyers vote with their wallets, and companies have to listen.

1. **Compaq Deskpro 5/60M Model 510/1020/w** *pg. 150*
2. **NCR System 3333** *pg. 143*
3. **Tagram Concerto Hi-Note 486DX2-66** *pg. 148*
4. **Nat'l MicroComputers Universal Pro-System** *pg. 143*
5. **Netis N4D266VL** *pg. 146*, **Polywell Poly4586-66VC** *pg. 148*

final word: Even if you *think* you'll never need more than 8MB of RAM, you never know when your needs will change.

Upgrade Issues and Processor Dead Ends

Despite the allure of Pentium, systems built around the 486DX2-66 are still the business user's main power system. As this review shows, you still get a big price break on DX2s over Pentium boxes, and an affordable 486DX2-66 local bus PC is no slouch when it comes to recalculating a giant spreadsheet. The first 486DX2-66s lacked an upgrade path; fortunately, those DX2-66s are still powerful machines (as you know if you bought one), and they'll continue to stand up well to demanding business applications.

The upgrade picture remains hazy for the current crop of DX2-66s, but Intel assures us that a Pentium OverDrive will be ready soon. According to the processor giant, you'll be able to upgrade systems *if they have the correct design specifications and 238-pin CPU sockets*. Intel is now touting its own Pentium-ready certification process, which will allow vendors to earn the Intel system-upgradability stamp of approval. The additional paperwork isn't gladdening vendors' hearts, but most major manufacturers will probably go along. What can consumers expect? If they're lucky, guaranteed upgradability. Even with that in mind, the best advice for most users remains the same: Buy a PC with a processor that can handle your applications for the foreseeable future.

Pentium systems—with the exception of Compaq's Deskpro 5/60M with its modular CPU-card construction—generally have no apparent upgrade path. Since these computers are the fastest PCs yet developed, however, it's unlikely that application power demands will outstrip their ability to deliver anytime soon.

Performance PCs on the Fast Track

Pentium systems from ALR, IBM, Compaq, and Acer ranked one through four, respectively, on the PC World Test Center's applications test suite. The IBM unit trailed the leading ALR Pentium by a minimal 10 percent overall, while the Compaq and Acer units came in about 25 percent behind the leader. The 486DX2-66s are still powerful PCs, and they also looked good, with the NEC Image 466es posting the fastest numbers, about 35 percent behind ALR's Pentium. Systems from Gateway 2000, Zeos, National MicroComputers, and Acma packed in so close to the NEC, we doubt you could perceive the difference in overall speed. Benchmarks on the 12 top 66s varied by just 13 percent. To no one's surprise, the 486DX2-50 ALR Flyer VL 4/50d brought up the rear, about half as fast as its Pentium stablemate.

Service That Stays With You

As always, service and support counts big. The top-tier vendors stand very strong in this area, although only two actually earn a service-and-support icon. Compaq and NCR both offer impressive 36-month warranties and 24-hour toll-free technical support. Smaller companies fill out the balance of our top group. Tagram, National MicroComputers, Netis, and Polywell provide the balance of warranty and service and support it takes to win top honors. Netis and Polywell tie for fifth position, so we award six icons this month.

Industrywide, there's a trend of longer warranties: AST, Compaq, Comtrade, NEC, and NCR all cover repairs for an outstanding 36 months. And the Ares, Polywell, Tagram, and Tri-Star machines come with 24-month warranties (Polywell covers labor for 60 months, while ALR covers parts for the same length of time). Of our 25 machines, 18 come with at least a year of free on-site service; another 5 charge $80 or less for the first year. Only CAF and Insight fail to provide an on-site–service option.

Barring equipment failure, the support you'll most likely need is some timely advice. You should put the emphasis on timeliness, and demand accurate answers. It's rare to have to pay the toll for system support calls these days, and all the companies here except

AcerPower Series 9000

VITAL STATISTICS

Street price: $5800
Processor: Intel Pentium-60
PROS: Fast, 520MB hard drive, 17-inch monitor
CONS: Flimsy inner case, single-speed CD ROM drive
Contact: Acer America Corp., 800/733-2237
Reader service no. 673

When you pay over $5000 for a system, you expect a lot in return, even if it's a Pentium PC. And the AcerPower Series 9000 delivers an impressive assortment of high-class features, including an EISA/VESA bus, a Pentium-60 CPU, 16MB of RAM, and a jumbo 520MB hard drive. In addition, you get a lovely 17-inch AcerView 76i monitor and a Diamond Viper local bus graphics accelerator with 2MB of VRAM.

The AcerPower Series 9000 provides Pentium performance, outpacing our average 66-MHz system by 27 percent overall. One local bus slot and six EISA slots are free, along with two externally accessible drive bays. But 4MB SIMMs fill all the 72-pin sockets. On a powerhouse like this, you may want a future RAM upgrade—especially if you move to OS/2 or Windows NT—and you don't want to have to discard paid-for RAM. So we suggest buying this system with a single 16MB SIMM installed; even if it costs extra now, you'll save in the long run.

You don't need any tools to open the case, although the uninitiated may find the procedure awkward. And the inner case is unusually flimsy; to keep internal components from flopping around, always replace the cover before moving the PC.

Acer's service and support is very good overall and includes a year of free on-site service. Technicians fielded our calls ably on Acer's round-the-clock support line, and the longest hold time was 5 minutes. Our biggest complaint concerns the single-speed Sony CD ROM player, which is based on first-generation technology. If you're interested in running tomorrow's multimedia applications, you'll need a second-generation double-speed drive. Make sure you buy one that can sustain transfer speeds in the neighborhood of 300K per second. While the AcerPower Series 9000's capacious hard disk and super video setup tend to mitigate its high price, the Best

CAF have 800 numbers. All the vendors provide free support for the life of the machine, with the curious exception of Unisys, which gives just 90 days.

We base our service-and-support evaluations on company policies and on calls we make simulating technical problems. Last October we began publishing a monthly fax-back service-and-support survey. In our March issue, we'll begin using information from these evaluations to supplement our other research.

The Best of the Best

We're seeing a growing number of good values in our reviews. More than two-thirds of the top systems reviewed here rate within 10 percent of each other. In fact, the leading systems bunched so closely, we had to award six Best Buys! High prices did hurt the Pentium machines' cost ratings, although not too badly. Among the Pentiums, only the Compaq Deskpro 5/60M—handicapped by its steep $7200 price—misses a good value rating. And the Pentium IBM ValuePoint P60/D, with a reasonable $4999 price, earns a fourth-place Best Buy. This PC, buoyed by super performance, terrific expandability, and fine service and support, is also the first production system we tested equipped with the fast PCI expansion bus.

The best systems bunched so closely, we had to award six Best Buys, including one to the IBM ValuePoint Pentium PC.

All the other Best Buys are DX2-66s—illustrating this processor's power on the business PC high ground. Earning another chunk of fourth place, the Dell Dimension 466V/XPS combines superior expandability and performance with a reasonable price and good service. Gateway 2000's 4DX2-66V has a very good price and is still one of the fastest, most expandable machines on the market. A steady recovery of Gateway's service rating provided the final push, earning this PC the last piece of our three-way tie for fourth place.

Comtrade's EISA VL-Bus Professional 66 stands alone as our third-ranked Best Buy, earning this honor primarily with a great combination of flexible expandability and a 36-month warranty. The Zeos 486DX2-66, with simply torrid performance, an outstanding price, and fine service, is our number two Best Buy. In the top spot is the Netis N4D266VL, a system that combines a mind-boggling $2385 price with first-quality service and support. None of our Best Buys offer less than 340MB of hard disk storage, and both Comtrade and Zeos provide more than 500MB. In addition, Dell, Gateway, and IBM all provide a hefty 16MB of RAM.

Our Best Buys are not the only fine buys. Consistently in our recent reviews, a fair percentage of PCs have presented very good values. This review is no exception, and just a half-step behind the Best Buys are 486s from Ares, NEC, National Micro-Computers, and Diamond, and ALR's Pentium powerhouse Evolution V—the fastest in the roundup. That brings us back to the question of whether lightning-quick Pentium systems are worth their extra cost. Considering the IBM ValuePoint's Best Buy showing and the ALR Evolution V's high ranking, we have to just say yes.

Rex Farrance is an associate editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).* PC World *staff members Mike Desmond, Ulrike Diehlmann, John Goddard, Anita Hamilton, Caroline Jones, Owen Linderholm, Dan Miller, and Susan Silvins contributed to this article.*

For more information about all products in this article, circle reader service no. 902.

Buy IBM ValuePoint P60/D provides a considerably better value in a Pentium system. (At press time Acer dropped the price on this PC by about $400, making it a much more attractive value.)

Acma 486/66/DX2 System

VITAL STATISTICS

Direct price: $3495
Processor: Intel 486DX2-66
PROS: Good performance and expandability
CONS: Poor documentation
Contact: Acma Computers, 800/786-6888, 510/623-1212
Reader service no. 674

The decision to buy at the high end, where low cost isn't your primary consideration, means you can think big—and may have you looking at Acma's roomy 486/66/DX2 System, a full-size tower that's loaded with components and comes at a reasonable $3495 price. Like many of the PCs here, the Acma comes with a 486DX2-66 CPU and a 256K secondary cache. But this system sports a generous 16MB of RAM, a big 544MB Conner IDE hard drive, and a 4MB VESA local bus caching disk controller. This potent mix equips the Acma to run Windows NT without an upgrade, and the system would also make a hot OS/2 workstation. In our Windows test suite, the Acma outperformed our average DX2-66 by almost 20 percent. Granted, it couldn't keep pace with the Pentiums, but it ran neck and neck with the fastest 486s. And the video setup is about as good as you'll find: a Diamond Viper VLB local bus graphics accelerator (with a healthy 2MB of VRAM) paired with a flicker-fighting 15-inch Mag monitor.

Inside, system RAM is easy to reach and expandable to 32MB; just pop in four more 4MB 30-pin SIMMs. In addition, there are four free ISA slots, five free drive bays, and a 238-pin ZIF CPU socket. Unfortunately, the internal scenery is littered with wires and cables. Worse, removing or installing VL bus cards causes the motherboard to flex more than we'd like.

As usual, Acma service and support rates well. We had little problem getting through on Acma's toll-free lines, and the technical support staff was generally accurate. The company offers a 45-day money-back guarantee along with a year of free on-site service, but

the basic one-year warranty and weekday-only support can't match the policies of the top companies. Still, this is a fast system with a good price and plenty of expandability. If you need a big PC with a great video subsystem—and you don't want to pay an arm and a leg for it—the Acma 486/66/DX2 System merits consideration.

ALR Evolution V

VITAL STATISTICS

Direct price: $5088
Processor: Intel Pentium-60
PROS: Fast, fine service and support
CONS: High price
Contact: Advanced Logic Research, 800/444-4257, 714/581-6770
Reader service no. 675

ALR's latest bundle of dynamite is proof that big power can lurk inside a small package. At the core of this compact desktop is the hot 60-MHz Pentium processor. Amply fleshed out with 16MB of RAM, a 256K secondary cache, and a Conner 544MB IDE hard drive, the Evolution V is a solid candidate for a Windows NT workstation and has more than enough zip for OS/2. Given its Pentium processor, we weren't terribly surprised to see the Evolution blaze through our test suite. In Windows tests, this system ran approximately 50 percent faster than the average DX2-66 system we've reviewed, and, helped by a hefty 4MB caching disk controller, it performed twice as fast as the average 66 on the Paradox test. Its BAPCo grades were equally impressive—70 percent faster than our average system. Now that's the kind of outstanding application performance we were expecting from the Pentium—and the brand of raw speed that's bound to inspire a case of Pentium envy in any user who tries out an Evolution V.

As you'd expect with an ALR design, the Evolution's interior is cleanly laid out, and the Pentium CPU has plenty of fan-cooled airspace. ALR even attaches a RAM-expansion guide to the inside of the PC's cover. Four of the Evolution V's six expansion slots are free, including one VESA local bus slot. Two other VESA slots are filled with the caching disk controller and an ATI Mach 32 graphics accelerator with 2MB of speedy VRAM. Two externally accessible 5¼-inch drive bays are free.

ALR service and support is strong and consistent; technicians responded promptly to toll-free calls (even on Saturday) and answered every one of our questions with near-perfect accuracy. The company offers a 15-month labor warranty and covers parts for an impressive five years as well. ALR also provides a year of free on-site service and a 30-day money-back guarantee.

Sure, we have a few beefs. First, with a PC priced around $5000, it would be nice to have a monitor larger than the 14-inch ALR FlexView. And while ALR's documentation is generally complete, much of it is a bit too terse for our taste. Still, with its formidable performance, memory, and storage, the Evolution has an awful lot going for it—especially as a server or an NT system—and we rate it as a very fine value.

Ares 486-66DX2 EISA/VESA

VITAL STATISTICS

Direct price: $3295
Processor: Intel 486DX2-66
PROS: Expandable, 60-day money-back guarantee
CONS: None
Contact: Ares Microdevelopment, 800/322-3200, 313/473-0808
Reader service no. 676

The Ares 486-66DX2 EISA/VESA is loaded for power and expandability. For $3295, you get 8MB of RAM, a 256K secondary cache, and a 340MB hard drive with a 2MB local bus caching controller. And there's plenty of room to grow: RAM capacity maxes out at a dizzying 256MB, the secondary cache expands to 512K, and even the caching controller can accept 16MB more. Finally, the DX2-66 processor rests in a 238-pin ZIF socket. This fast system's benchmark results surpassed those of the average 66-MHz 486DX2 by a healthy 12 percent. The large tower configuration provides four free drive bays and a free local bus slot. If you're looking for a server or an engineering workstation, you'll appreciate the four free EISA slots. The video subsystem isn't bad either: The combination of a Hercules Graphite VESA local bus graphics accelerator and a 15-inch CTX monitor should suffice for most business applications.

Ares seems confident you'll like its products: The company offers a singular 60-day money-back guarantee. You also get a generous two-year parts and lifetime labor warranty and 24-hour toll-free technical support. The technicians answered our test questions accurately—although response times varied more than we like. Considering the month-to-month fluctuation in even the best companies' responsiveness, however, we're reasonably satisfied. And looking at the big picture, it's impossible to ignore this unit's versatile expandability, which includes the capability to handle EISA cards. When you add the robust service and support into the mix, you come up with one of the best values here—a system that misses a Best Buy by a whisker.

AST Premmia 4/66d Model 343W

VITAL STATISTICS

Street price: $3967
Processor: Intel 486DX2-66
PROS: Upgrades to true Pentium, fast, 17-inch monitor
CONS: High price
Contact: AST Research, 800/876-4278, 714/727-4141
Reader service no. 677

If you're the type who wants steak at hamburger prices, the AST Premmia is not the system for you. If, on the other hand, you're

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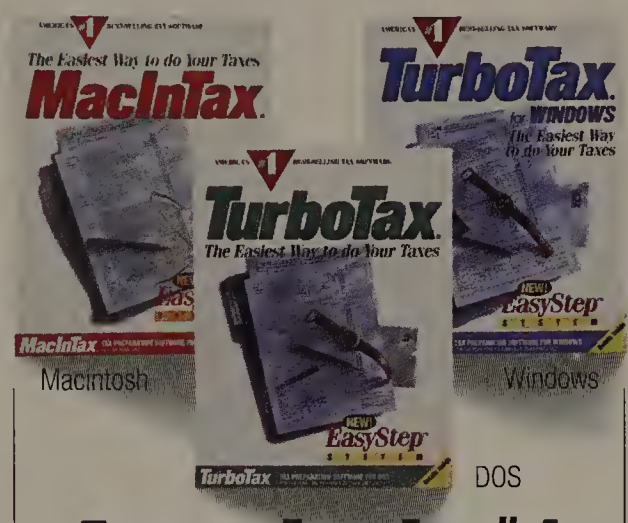

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PC MAGAZINE EDITORS' CHOICE FEBRUARY 23, 1993 TURBOTAX FOR DOS

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willing to pay top dollar for top sirloin, you might want to give the Premmia a look. When it comes to performance, expandability, *and* price, this system is a premium cut.

If you're looking for speed, the AST Premmia 4/66d is one of the fastest systems here—17 percent faster overall than our average 66. It's particularly adept at graphics- and disk-intensive work—23 percent faster than average in the Freelance test and a whopping 44 percent faster in Paradox. AST uses a proprietary local bus for both the ATI Mach 32 graphics accelerator chip and the hard drive adapter. And the entire video subsystem—with its big 17-inch AST display—supports an eye-easing 76-Hz refresh rate up to 800 by 600 resolution.

If the Premmia's current performance isn't enough for you, ample upgrade options are available. The system features an EISA bus, the favored choice for engineering and design workstations as well as the de facto LAN server standard. All five EISA slots are free, as are two of the compact case's externally accessible drive bays. The Premmia's RAM and secondary cache are upgradable to 128MB and 512K, respectively, and a 238-pin ZIF CPU socket will let you upgrade the current DX2-66 to some form of future Intel OverDrive chip. But the Premmia has another upgrade option you won't find elsewhere: The socket for the system's secondary cache module is designed to take a CPU upgrade module containing a *true Pentium* CPU. AST says its Pentium module will be available during the first quarter of 1994; pricing's not yet available.

AST backs the Premmia with beefy service and support, including a three-year warranty, a year of free on-site service, and toll-free tech support 24 hours a day. Our main gripe: Getting through to a human respondent on the tech support voice-mail system can be a long, confusing process. Our only other complaint is the $3967 price, which is likely to be hard for budget buyers to swallow. If you've got the dough, however, the Premmia is a prime choice.

Blackship BLK 486/66LB

VITAL STATISTICS

Direct price: $1995
Processor: Intel 486DX2-66
PROS: Inexpensive
CONS: Relatively few tech support hours
Contact: Blackship, 800/531-7447, 408/432-7500
Reader service no. 678

In last month's system review, we noted that the line between high-value and high-power PCs is blurring. Blackship's BLK 486/66LB is clearly a case in point. This month's Blackship is a solid—if unremarkable—DX2-66. Its 8MB of RAM, 256K of secondary cache, 244MB Quantum hard drive, and 14-inch monitor are basics for a 66-MHz machine. But the system's $1995 price is a knockout—especially considering that the 486/66LB's performance matches that of our average 486DX2-66. The system scored higher on our Freelance and Paradox tests and lagged slightly on the BAPCo suite.

This minitower has generally decent expandability and includes a 238-pin ZIF socket, designed to let you upgrade to a future Intel OverDrive processor. Also, five of the seven expansion slots are free. All the free slots are 16-bit ISA; the two VESA local bus slots are filled with the video and hard drive adapter. Unfortunately, because of the placement of the CPU with its fan-cooled heat sink, only one free slot accommodates a full-length card. Of course, because of increasing component miniaturization, card lengths are generally smaller than in the past. RAM is very accessible and expands to 64MB, but you have to remove at least four of the eight 1MB SIMMs to go beyond the standard 8MB. And you can expand the secondary cache to an impressive 1MB. The documentation covers every aspect of the PC and is adequate if not fancy.

Blackship's solid service and support includes a one-year warranty backed by free on-site service, a 30-day money-back guarantee, and five-day-a-week toll-free tech support. Although the company's daily tech support hours are run-of-the-mill, all our calls were answered right away. Uncharacteristically for Blackship, the technicians missed our toughest question this time.

If you're looking for the ultimate high-power PC, the BLK 486/66LB won't knock your socks off. But Blackship does deliver a lot of machine for the money.

Comtrade EISA VL-Bus Professional 66

VITAL STATISTICS

Direct price: $3295
Processor: Intel 486DX2-66
PROS: Three-year warranty, 544MB SCSI hard disk
CONS: Cluttered interior
Contact: Comtrade, 800/969-2123, 818/961-6688
Reader service no. 679

At first glance, the $3295 Comtrade seems a bit pricey for a compact 66. But a closer look reveals a Best Buy system loaded with powerful potential. In fact, this machine would do a competent job as a server for a small-office LAN or—with its 15-inch monitor—as an engineering or design workstation. Not that its extra capabilities should keep it off your desktop.

Like many of the PCs here, this system uses an Intel 486DX2-66 CPU. Unlike most, however, the Comtrade combines two 32-bit buses and a 16-bit ISA bus, so its motherboard offers great versatility. Two VESA local bus slots (one free), three EISA slots (two free), and three 16-bit ISA slots (two free) permit an expedient mix of peripherals—such as the fast Diamond Viper VLB local bus graphics accelerator with 2MB of VRAM, the 4MB EISA SCSI caching hard disk controller, and an 8-bit card (installed in a 16-bit slot) to handle the I/O ports.

The Comtrade has 8MB of RAM, a 256K secondary cache, and a big 544MB Conner SCSI hard disk. Performance overall is average, but the EISA caching drive controller contributed to an outstanding result in our Paradox test—36 percent faster than our average DX2-66. That's good news if your main application is very disk intensive.

The downside of stuffing the amenities of a server into a compact case is compromised accessibility. Upgrading SIMMs in the cluttered interior is a challenge, as the I/O card and power supply are in the way. And in the 8MB configuration, all the 30-pin SIMM sockets must be filled with 1MB SIMMs. We suggest ordering the PC with 16MB of RAM, which not only gives you more RAM but also leaves four sockets open for further upgrades (128MB is the limit). Two externally accessible drive bays are free. The SCSI drive controller's external port adds a host of SCSI peripherals to your expandability options.

Strong service and support includes a three-year warranty, a year of free on-site service, and responsive, toll-free tech support 12 hours a day, six days a week. If you can tolerate a rough edge or two and you order this Best Buy PC with the correct RAM configuration, you'll wind up with a versatile, value-packed workhorse.

Dell Dimension 466V/XPS

VITAL STATISTICS

Direct price: $3318
Processor: Intel 486DX2-66
PROS: Excellent performance and design
CONS: Longish waits for tech support
Contact: Dell Computer Corp., 800/289-3355, 512/338-4400
Reader service no. 680

The Dimension 466V/XPS is the most muscular member of Dell's inexpensive value line. But despite a $3318 price that seems low for a Dell, the company has cut precious few corners. In fact, this system has refinement written all over it, with outstanding design extras that make it an easy Best Buy.

For starters, components such as RAM, secondary cache, and add-in boards are kept clear and easy to reach. For the ultimate in an easy RAM upgrade, Dell installs 16MB of RAM in a single SIMM module, leaving three SIMM sockets open to accept upgrades all the way to the maximum 64MB. And the Dimension has plenty of expandability: five free 16-bit ISA slots, one free VL slot, and three free drive bays, two of them externally accessible.

The Dell powered through our application test suite, posting scores almost 12 percent better than our average 486DX2-66 and just 9 percent behind NEC's overall 486 winner. Of course, the Dimension 466V/XPS's performance wasn't hurt by the fast Diamond Viper VLB graphics accelerator with 2MB of VRAM. With its healthy complement of RAM, 256K secondary cache, and 340MB Western Digital Caviar hard disk, this PC is a credible applicant for a job handling OS/2 or Windows NT. And Dell even throws in a 15-inch monitor.

When it comes to service and support, few companies surpass Dell's reputation. The package includes 24-hour toll-free support and a one-year warranty backed by free on-site service. What diminished Dell's score this time was the 5 to 10 minutes we had to wait on hold before we reached a support technician. But as always, Dell provided impeccable courtesy and dead-accurate answers. And the system documentation is terrific, with clear, detailed instructions. All in all, the Dell Dimension 466V/XPS presents a tremendous package. It's not the fastest 486 here, but it features top design, quality construction, and a reasonable price—and it's backed by one of the most respected names in the business. All that adds up to a slam-dunk Best Buy for Dell.

Diamond DT 486DX2-66 VL-SCSI

VITAL STATISTICS

Direct price: $2799
Processor: Intel 486DX2-66
PROS: Low price, SCSI hard drive, removable IDE hard drive
CONS: Inefficient design
Contact: Diamond Technologies, 800/989-7253, 714/533-9910
Reader service no. 681

The Diamond DT's $2799 price ties for fifth lowest here—but this PC is not just inexpensive. It's loaded with mass storage capabilities, including a 320MB SCSI hard drive and an additional 80MB removable IDE hard drive. The removable drive lets you secure sensitive data off site or transport applications and data between systems equipped with drive receptacles. The standard 8MB of RAM can go as high as 128MB, and you can expand the 256K secondary cache to 512K. In addition, the system accepts a wide range of peripherals. You get five 16-bit ISA slots (three free), two VESA local bus slots, and even a free EISA slot. Additional peripherals, such as magneto-optical and CD ROM drives and scanners, can be daisy-chained off the external port on the local bus SCSI-2 host adapter.

Performance on this 486DX2-66, however, dips below average. And the system doesn't show much polish. The 8MB of system RAM sit beneath an unrestrained jumble of cables and fill all eight SIMM sockets, so you have to discard existing SIMMs when you want to upgrade. Diamond installed some of the I/O ports in a slot backplate connected to the main I/O card with cables—a common practice. If you need to use such an obstructed slot, you can usually reinstall the ports in dedicated case cutouts. But with Diamond's setup, you can't move the ports without buying longer cables. It would be a whole lot easier for the system buyer if Diamond had just included longer cables with the PC. And the Diamond DT's graphics subsystem is just so-so. The Western Digital Paradise graphics accelerator with 1MB of DRAM is adequate, but Diamond supplies a fairly low-grade 14-inch CTX monitor.

Diamond service and support rates high, with a competitive 15-month parts warranty (24 months on labor) and toll-free phone support. Diamond never forced us to wait for a technician, and every question was answered with impeccable accuracy and courtesy. On balance, this PC—with its nifty removable hard drive and SCSI adapter—provides a whole lot of value. But Diamond cut some corners to give you the low price. So if the DT 486DX2-66 VL-SCSI turns you on, make sure a flicker-free video subsystem isn't a high priority—or purchase a better video option.

Gateway 2000 4DX2-66V

VITAL STATISTICS

Direct price: $2995
Processor: Intel 486DX2-66
PROS: Fast, excellent expandability, CD ROM drive
CONS: So-so service and support
Contact: Gateway 2000, 800/846-2000
Reader service no. 682

For several months last year we had a hard time recommending Gateway systems. The company's tech support staff, caught temporarily shorthanded by fantastic sales, could not answer calls in a timely manner, and sometimes we were unable to complete our support inquiries for a review. When we called for this month's review, however, we consistently got through in 8 minutes or less; that may seem like a relatively long wait, but it's a huge improvement. Considering the balance of good price, fast performance, and full features that Gateway 2000 routinely provides, it's great to see the service picture brightening.

The resurrection of Gateway's phone support helps make this $2995 local bus speedster a Best Buy. We've reviewed it before, and it's still one of the fastest Windows machines on the market. Spurred along by local bus drive and graphics adapters, it's 23 percent faster in our Windows suite than our average 486DX2-66.

We're also impressed with this full-size desktop's expandability: It comes with a 238-pin ZIF CPU socket, a roomy 424MB hard drive, and a hefty 16MB of RAM. You can upgrade RAM to 64MB, although all four SIMM sockets are already filled, so you'll have to discard one or more 4MB SIMMs, depending on the size of your upgrade. But with the double-speed CD ROM drive installed, two 5¼-inch drive bays still remain free for a second floppy and a tape drive. One of the two VLB slots is occupied, but all five of the ISA slots are available. That should be plenty for almost any application.

We've reviewed this $2995 local bus speedster before, and it's still one of the fastest Windows machines on the market.

Gateway 2000 technical support hasn't completely regained its former preeminence; the competition is now stiffer. The one-year warranty doesn't match the two- and three-year policies now available from some vendors. Gateway's tech support lines are open 18 hours on weekdays, 5 hours on Saturday, and never on Sundays. That's still very good—just not the best. But the difference between Gateway's solid support and the state of the art doesn't keep droves of buyers from snapping up Gateway systems. Why? Because products like the Best Buy 4DX2-66V are such super combinations of performance and features—delivered at an attractive price—that they're always among the best values available.

IBM PC Company ValuePoint P60/D

VITAL STATISTICS

Direct price: $4999
Processor: Intel Pentium-60
PROS: Excellent performance and documentation
CONS: Expensive
Contact: IBM PC Company, 800/426-2968

The folks at IBM PC Company make quite a statement with the $4999 ValuePoint P60/D. Packed with the latest features and next-generation technology, this Pentium-based powerhouse straddles the line between high-end workstations and typical business PCs—and does such an outstanding job, it earns a Best Buy in the process. If you're running OS/2 or Windows NT, or if you just want one of the fastest PCs around, the ValuePoint P60/D has you covered.

The ValuePoint P60/D features the first PCI expansion bus we've seen on a production system. On this machine, the PCI bus uses a 32-bit data path and a 30-MHz clock to speed data I/O. The PCI bus and hot processor helped the ValuePoint P60/D slash through our tests almost 35 percent faster than our average 486DX2-66. Those results place the ValuePoint a very close second to the front-running Pentium ALR Evolution V. It's worth noting that the integrated PCI-bus ATI graphics accelerator boosts Windows performance, but the system couldn't quite match the leaders' caching hard disk controllers on the most highly disk-intensive tests (Paradox being the best example).

You get a power user's configuration when you buy this PC: 16MB of RAM expandable to 128MB, a 256K secondary cache, and a 424MB IDE hard disk (a just-released 527MB Maxtor MXT/527 IDE drive is available instead for $480 more). Two of the four SIMM sockets are filled by 8MB SIMMs, so you have room to add more RAM if you need it. With a PC this powerful, you may—especially if you plan to take advantage of expected Windows NT applications. The included monitor has all the right stuff: A 15-inch display provides a flicker-free 76-Hz refresh rate even at the top 1280 by 1024 resolution. And there's room to grow inside this compact. Three free ISA slots and two free PCI slots are mounted on a vertical card. You can install either two ISA and two PCI cards or one PCI and three ISA cards. And you get three free drive bays (two externally accessible).

IBM PC Company continues IBM's long-standing tradition of great documentation, and the warranty and service package is solid industry standard, including one year of free on-site service. But our calls to the 24-hour toll-free technical support line left us scratching our heads this time. Responsiveness was superb, but accuracy fell short of our expectations for IBM. Overall, however, the IBM ValuePoint P60/D is an impressive combination of Pentium CPU and PCI bus—the perfect juxtaposition of two new technologies. If you're looking for Pentium power at the price of some high-end DX2-66s, this Best Buy is too good to miss.

Insight 486DX2-66 Smart Server

VITAL STATISTICS

Direct price: $2799
Processor: Intel 486DX2-66
PROS: High-resolution video, good price
CONS: Inflexible RAM upgrades
Contact: Insight, 800/927-7848
Reader service no. 683

Users are to be pardoned if they're confused by this big Insight PC. While its name and expandable tower configuration spell server, the VESA local bus graphics accelerator with 1MB of DRAM and 17-inch Mag monitor speak more to the graphics power user. And the 486DX2-66 Smart Server *would* make either a fine server for a midsize LAN or a knockout CAD/CAM workstation. But when you get right down to it, the wide screen would be welcome in any business application. Who among us wouldn't like to be able to see the bigger picture? And a 17-inch monitor opens up the world of higher resolution—the 1024 by 768 mode that would have you reaching for a magnifier on a 14-inch monitor is quite usable for most people on the 17.

The Insight's name and its expandable tower spell server, but the 17-inch monitor speaks more to the graphics power user.

The Smart Server does not lag when it comes to performance, either: It matches or exceeds our average 66-MHz system in every application benchmark. The motherboard is well laid out, with SIMM sockets and the ZIF CPU socket fully accessible no matter how many expansion cards you install. And if you need more drive space than the four free drive bays provide, there's space and tapped rails to install another drive cage that can hold up to three additional 3½-inch drives. The part in question is a standard accessory that should be available at any sizable computer supply house. But if you buy the 8MB RAM configuration, upgrading will be expensive, as all eight 30-pin RAM sockets are full, and you must discard at least four 1MB SIMMS to add higher-capacity units. We suggest buying your system with 16MB installed. Then you'll have the four free sockets you need to expand RAM to the maximum 32MB.

Insight's basic service and support includes 24-hour toll-free technical support. We had to wait 15 minutes on hold during one call, but fortunately we ultimately got the answer we were looking for. Insight doesn't offer an on-site service option, although the company promises a three-day repair turnaround. This package matches good performance with high-end video—a balance you don't ordinarily find in a server. That—along with its outstanding $2799 price—may be enough to make you consider placing this big system at your deskside.

National MicroComputers Universal Pro-System 466

VITAL STATISTICS

Direct price: $3404
Processor: Intel 486DX2-66
PROS: Good performance, one-day repair turnaround
CONS: Slightly cluttered interior
Contact: National MicroComputers, 800/424-2983
Reader service no. 684

National MicroComputers' Universal Pro-System 466 is a nimble DX2-66 with 16MB of RAM, a 256K secondary cache, and a 4MB local bus caching disk controller. It outpaced the average DX2-66 by 17 percent overall. Storage is well handled by a nifty combo floppy drive and a 340MB hard disk.

National Micro's service stacks up well, too. The company offers fast, one-day turnarounds on factory repairs and a two-year labor and one-year parts warranty. On-site service is just $39 for the first year, and we got perfect tech support answers with an average of just 2 toll-free minutes on hold. You can't call on weekends, however.

Inside this full-size desktop case, the DX2-66 CPU rests in a 238-pin ZIF socket. We do wish National Micro had paid closer attention to tidying up the cables inside. But the 16MB RAM configuration leaves four 30-pin sockets free. You can expand all the way to 64MB if you have the inclination (and the bucks). You also get three drive bays (two external) and five 16-bit slots free.

This PC isn't a cheap model. Its $3404 price is middle-of-the-road for this review and above average for 486DX2-66s we've reviewed recently. But its copious system RAM and generous 4MB caching controller are above average too. Add in terrific service and support and fine performance, and you have a powerful system that's well worth considering.

NCR System 3333

VITAL STATISTICS

Direct price: $3695
Processor: Intel 486DX2-66
PROS: Excellent service and support, good expandability
CONS: Relatively high price
Contact: NCR Corp., 800/327-2600, 513/445-5000
Reader service no. 685

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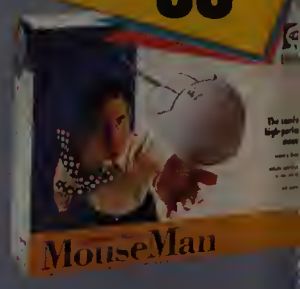

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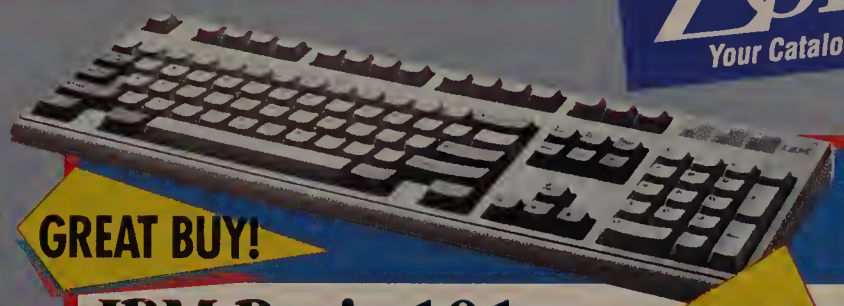

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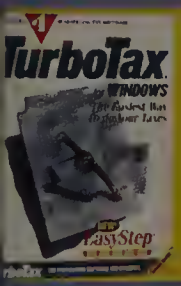

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When you open the 3333, you see what differentiates it from the nameless clones: plenty of room for expansion, and a DX2-66 CPU installed in a 238-pin ZIF socket. The 8MB of RAM fill only two of the four 72-pin SIMM sockets, making memory upgrades a snap—especially since you can mix and match different capacities of SIMMs. The secondary cache (64K is standard) comes on a plug-in module. So if you want a 256K secondary cache, order it with your system. The upgrade is easy, but you will have to discard the original 64K module.

The minitower case can also masquerade as a compact desktop unit. One of the six expansion slots is filled with a fast Diamond Viper local bus graphics accelerator, leaving a second local bus slot and four 16-bit slots available. And four free drive bays (two externally accessible) should cover typical desktop needs. A 340MB hard drive is just right for today's Windows user.

What's the downside? Price. At $3695, this PC will never make it down to the bargain basement. But if top-notch service and support and high-class design—combined with good performance—are worth some extra dollars to you, this might be just the PC you're looking for. If performance is your prime consideration, however, you can find equal or better for hundreds less.

NEC Image 466es

VITAL STATISTICS

Street price: $3510
Processor: Intel 486DX2-66
PROS: Top performance, great monitor, integrated SCSI
CONS: A little pricey
Contact: NEC, 800/388-8888
Reader service no. 686

The beautifully designed NEC Image 466es runs circles around much of the competition, outpacing most DX2-66s—and almost nailing a Best Buy. The NEC raced through our Windows Freelance test a staggering 50 percent faster than our average 66. This compact comes with a 238-pin ZIF CPU socket, 8MB of RAM (upgradable to 128MB), a 256K secondary cache, an integrated local bus graphics accelerator, and a spacious 420MB Western Digital Caviar hard drive. Top all this off with NEC's stellar 4FGe 15-inch flat-screen monitor, and you've got a system bound to entice users of graphical Windows apps.

The motherboard integrates a SCSI port (there's also an external port). Four expansion slots are free (two accept VL cards). You can set up the case in either a desktop or a tower configuration, but be careful: The lightweight modular design gives you easy access to all the components, but some can come loose if you move the PC around with the top case off.

NEC offers a generous three-year warranty, with on-site service free for the first year and a reasonable $75 a year for the next two. Top-notch phone and fax technical support is available 12 hours a day but not on weekends. The Image 466es's great design comes at a cost, although $3510 isn't bad considering the fine video subsystem and other perks. Fast, flexible, and expandable, the NEC Image 466es should be a sound long-term investment.

Netis N4D266VL

VITAL STATISTICS

Direct price: $2385
Processor: Intel 486DX2-66
PROS: Top service and support, great price, good performance
CONS: Cluttered motherboard layout
Contact: Netis Technology, 408/263-0368
Reader service no. 687

The Best Buy Netis N4D266VL proves that you don't have to spend big bucks to get a system that really hums and is backed by great support. This $2385 PC is about 10 percent faster overall than our average 486DX2-66, and Netis doesn't short you on features—you get a 238-pin ZIF CPU socket, a 340MB hard drive, and a 2MB Promise Technology VL-Bus caching hard disk controller. The latter undoubtedly contributed to the N4D266VL's very good performance on our Paradox benchmark. Another classy performance perk is the Diamond Viper VLB graphics accelerator with 2MB of VRAM. Expandability is solid too, with four free 16-bit slots, one free 8-bit slot, and two free externally accessible 5¼-inch drive bays.

As you'd expect, the Netis doesn't include design fine points found in more expensive PCs. All eight 30-pin memory sockets are filled with 1MB SIMMs in the 8MB RAM configuration. To upgrade, you must pull at least four of them and install four 4MB SIMMs. The smart way to buy this system (unless you plan never to upgrade memory) is configured with 16MB of RAM (four 4MB SIMMs and four RAM sockets free). Netis's outstanding system price—the second best here—will ease the extra bite on your wallet.

The N4D266VL's internal layout isn't perfect: It's a bit cramped, and the CPU socket sits at the end of the four free slots, where a high heat sink could prevent all but half-length cards from fitting in three of the 16-bit slots. But service and support is terrific; toll-free tech help is available 10 hours a day, six days a week. Support responsiveness and accuracy are standouts, and Netis ties for fifth in our service-and-support rankings. The company fills out its policies with a one-year warranty, on-site service for $80 a year, and a 30-day money-back guarantee. Despite a few rough edges, the Netis N4D266VL's fine performance, low $2385 price, and super support make it the hands-down winner for top overall Best Buy.

"We were blown away by the Micro Express, which beat its nearest competitors by a fantastic 24 percent margin"

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ME 486DX2/66

"Our top overall value, the Best Buy Micro Express ME 486-VL/DX2/66, is a 66-MHz local bus machine with the fastest performance overall... Furthermore, the company's service and support topped the chart, just as it did in June.

"It's no surprise that 486DX2s are the quickest machines... but we were blown away by the Micro Express, which beat its nearest competitor by a fantastic 24 percent margin."

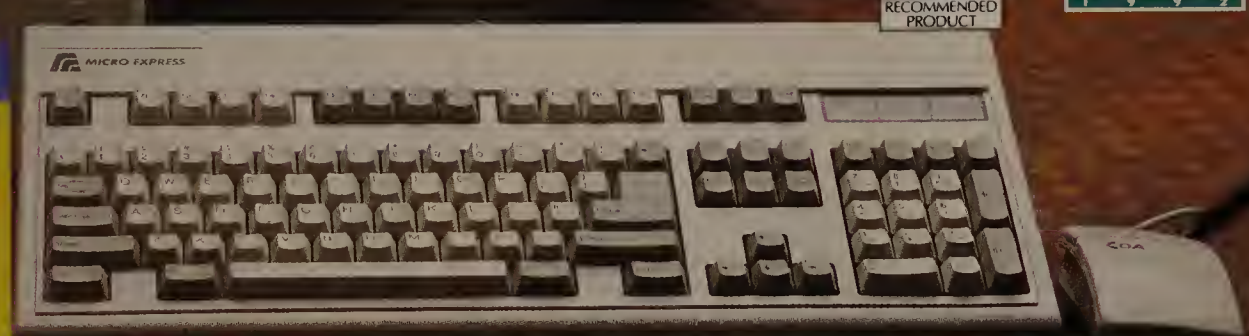
PC World, August 1993

"...with its superior product warranty and support, and outstanding processor speed, it also reflects...quality and exceptional engineering that could propel Micro Express to become a major player in the computer industry."

Computer Buyer's Guide, January 1993

"The Micro Express ME 486-Local Bus/DX2/66 has the lowest price of the bunch. This system showed itself to be a fine performer...."

InfoWorld, November 16, 1993



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Polywell Poly4586-66VC

VITAL STATISTICS

Direct price: $3985
Processor: Intel 486DX2-66
PROS: Multimedia setup, tape backup unit
CONS: Relatively high price
Contact: Polywell Computers Inc., 800/999-1278
Reader service no. 688

Polywell's Poly4586-66VC is a first-class PC—but its $3985 price won't win a bargain hunter's heart. However, a 238-pin ZIF CPU socket, 16MB of RAM, a 425MB hard drive, two floppy drives, a double-speed CD ROM drive, a sound card, speakers, and a great video setup justify the cost. Add a Conner CP250 tape backup unit that backs up approximately 250MB compressed on a single tape, and the picture looks even brighter. Performance tested about average overall but outstanding (63 percent faster than our average system) on Paradox.

The thoughtful design of this midsize tower leaves room for three full and two half-length 16-bit cards. There's one free externally accessible bay, and an optional internal cage will hold three more.

Polywell support is fantastic, with a five-year labor warranty (two years' free parts), a year of on-site service for $75, and toll-free tech support 9 hours a day weekdays and Saturdays. We got nothing but accurate, immediate responses. As a result, Polywell ties for fifth with Netis for service and support. This system may not be a bargain, but it's a solid value and fairly priced for all its extras.

Tagram Concerto Hi-Note 486DX2-66

VITAL STATISTICS

Direct price: $2520
Processor: Intel 486DX2-66
PROS: Multimedia setup, good price, excellent support
CONS: Relatively slow performance
Contact: Tagram Systems Corp., 800/824-7267, 714/258-3222
Reader service no. 689

If this were a multimedia review, we'd give the Tagram Concerto a standing ovation. But as a *power* system, the Concerto almost misses its entrance, ranking among the slowest PCs here. The 250MB hard drive is on the small side for a power system, and the standard configuration is 8MB—with 30-pin 1MB SIMMs filling all the sockets.

The Tagram provides a 238-pin ZIF CPU socket, a Voyetra Audio 16 sound card, a CD ROM drive, a long list of CD ROM titles, and a Proton monitor with built-in speakers.

We can't kick about the outstanding $2520 price. Tagram cuts costs with a VLB card from BCM Advanced Research that handles the graphics accelerator, hard drive adapter, and I/O. You get five expansion slots (one VL) and one externally accessible 3½-inch drive bay free.

Service is great, with a two-year warranty, a year of free on-site service, and one-day turnaround on repairs. Super-responsive tech support is available 11 hours a day, six days a week. As you can see, when it comes to price, service and support, video subsystem, and multimedia extras, this system has a lot going for it. But it just doesn't have the performance it takes to entice a power user.

Zeos 486DX2-66

VITAL STATISTICS

Direct price: $2932
Processor: Intel 486DX2-66
PROS: Excellent performance, low price
CONS: Longish waits for tech support
Contact: Zeos Int'l, Ltd., 800/554-5220, 612/623-9614
Reader service no. 690

Considering the furious PC price cuts in the last couple of years, some may have thought Zeos would have trouble producing a competitive PC. The naysayers will have to think again. The Best Buy Zeos 486DX2-66 proves the business PC market hasn't bypassed this Minnesota-based direct vendor.

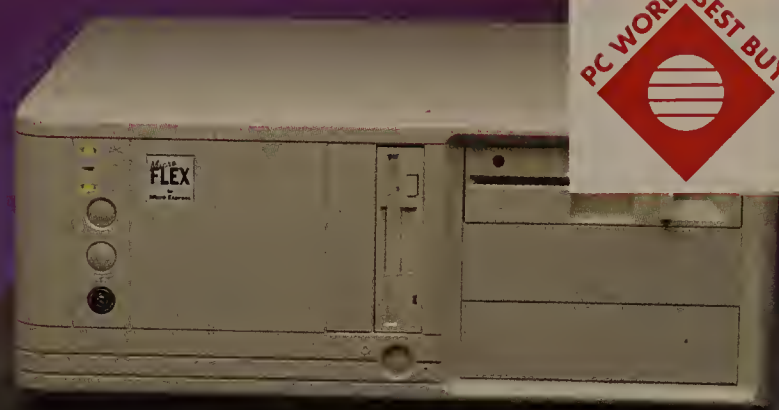
The Zeos 486DX2-66 comes with 8MB of RAM (expandable to 64MB) and a 256K secondary cache. It arrives ready to handle the most demanding storage needs with a big 528MB IDE hard drive and a fast Diamond Viper VLB accelerator card with 1MB of VRAM. And this system performs: The Zeos flew through our Windows tests as if shot from a cannon. Overall, it placed just 5 percent behind the fastest non-Pentium machine reviewed, outpacing our average 486DX2-66 by more than 15 percent. While the Zeos dropped a few places in our DOS-based BAPCo tests, its Windows benchmarks are more than impressive, surpassing those of our average 66-MHz system by almost 25 percent.

But there's more than speed and price to a PC. Zeos includes thoughtful touches, with a well-designed motherboard that allows easy access to expansion slots, cache sockets, and the 238-pin ZIF socket holding the CPU. While access to system RAM under one of the two installed floppy drives is a little tight, two open 72-pin sockets are in the clear and waiting for future upgrades. Finally, the Zeos offers excellent overall expandability, with six free ISA slots, one free VL slot, and an integrated internal SCSI port (but you'll have to buy the optional host adapter chip to enable it).

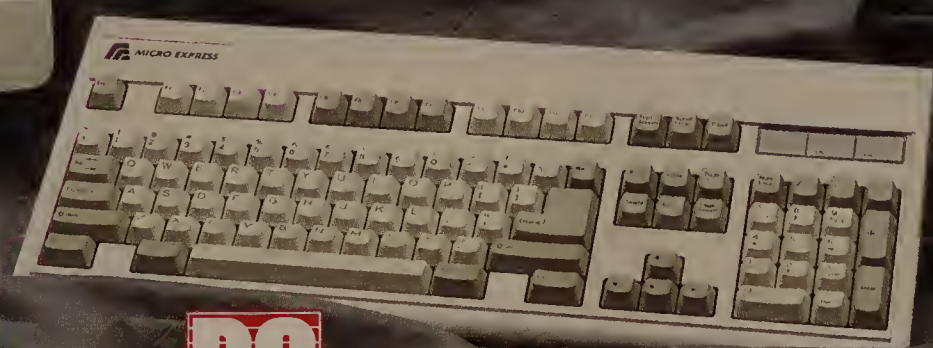
Zeos's service package is competitive, with a 30-day money-back guarantee, toll-free 24-hour tech support, and a one-year warranty. Zeos representatives answered our queries accurately, but we did find ourselves on hold for 10 minutes before getting through. Overall, this PC is a super Best Buy value, with fantastic speed and great expandability—and Zeos even throws in a free Lotus Windows application. That's a pretty irresistible combination.

"Overall, this is the best low-cost PC we've ever reviewed – bar none!"

PC WORLD



PC WORLD BEST BUY



ME 486DLC/40

"The top overall value is the Micro Express ME 486DLC/40. This standout system is built around the new Cyrix DLC chip, and it presented a staggering résumé, nailing down an excellent rating on performance, price *and* service and support...

"Say something good about this machine. Go ahead. And while you're at it, heap on a bunch of superlatives– chances are you'll be right on the mark! Overall, this is the best low-cost PC we've ever reviewed – bar none...This Best Buy PC is an easy winner in every category"

PC World, June 1993

"The Micro Express ME 486DLC/40 posted the fastest speed results..."

InfoWorld, February 8, 1993

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Circle 157 on reader service card

System Snapshots

These systems, while very capable, don't match the preceding group for overall value in a business environment. However, many of them present unique and valuable solutions to end-user needs.

ALR Flyer VL 4/50d

DIRECT PRICE: $2906 **PROCESSOR:** Intel 486DX2-50 **PROS:** Energy Star compliance, generous warranty **CONS:** Limited expandability

The ALR Flyer VL 4/50d's ultrasleek low-rise case looks fantastic—and its Energy Star rating indicates power savings. ALR designed well, leaving room to grow the 8MB of RAM to 24MB without pulling any SIMMs (36MB is the ceiling) and squeezing in a tiny proprietary 16-bit slot for an optional fax-modem, ethernet adapter, or SCSI adapter. Expandability, however, is limited to one free drive bay and two free 16-bit slots, so if you like to add drives, this is not your system. This PC *is* fast for a 50, about 15 percent faster overall than the average DX2-50. But stacked up against the 66-MHz competition, the ALR was 17 percent slower than the average DX2-66.

As mentioned in the review of ALR's Pentium system, this company's service and support is fine. But the Flyer's $2906 price is a little steep, and the ultracompact design is limiting. If desk space is tight and you don't mind paying for ALR quality, you might consider this box—but we think most buyers will find a better fit elsewhere. *Advanced Logic Research, 800/444-4257, 714/581-6770.* **Reader service no. 691**

CAF Master L737 DX2/66

STREET PRICE: $2495 **PROCESSOR:** Intel 486DX2-66 **PROS:** Very good support responsiveness **CONS:** No toll-free tech support or on-site service

At $2495, this is the third least expensive PC here. In terms of overall performance, it matches our average 66. But its results were erratic: 34 percent faster than average in Paradox, 15 percent slower in Excel. And the 213MB hard drive is smallish for today's power systems, although the 2MB local bus caching controller is a plus. The lack of upgradability is disappointing. The CPU's in a standard ZIF 486 socket, with no 238-pin upgrade path. The 8MB of RAM filling the eight 30-pin SIMM sockets can be expanded to 32MB, but you have to discard existing SIMMs. Four free bays and four 16-bit slots are fine.

CAF doesn't offer on-site service or toll-free support. Tech support, open 9 hours weekdays, is responsive and accurate. If you want top power, this CAF is not for you—check our Best Buys. *CAF Technology, 818/369-3690, 818/369-3690 (fax).* **Reader service no. 692**

Compaq Deskpro 5/60M 510

STREET PRICE: $7200 **PROCESSOR:** Intel Pentium-60 **PROS:** Fast, great monitor and design **CONS:** Highest price in roundup

The Deskpro 5/60M, a fast backplane-designed PC, features a 60-MHz Pentium CPU module. Only the ALR and IBM Pentium systems were faster. The Deskpro provides 16MB of RAM, a 510MB hard drive, four free EISA slots, and two free externally accessible drive bays. And it comes with a superb 17-inch monitor.

Compaq's top-rated service and support includes a three-year warranty, a year of free on-site service, and 24-hour toll-free support. In addition, Compaq throws in its versatile Business Audio, which lets you annotate documents and even command applications by using your voice instead of the mouse or keyboard. What gives us pause is the $7200 price (ouch!). That's a lot, even for a loaded, expandable, modular Pentium system. *Compaq Computer Corp., 800/345-1518, 713/378-8820.* **Reader service no. 693**

Tri-Star 486DX2/66 VL Station

DIRECT PRICE: $4595 **PROCESSOR:** Intel 486DX2-66 **PROS:** CD ROM drive, 17-inch Mag monitor, removable hard drive **CONS:** Relatively high price

The Tri-Star 486DX2/66 tower's system specs seem tailored to power users: 16MB of RAM, a 256K secondary cache, a 4MB Promise VLB caching controller, a double-speed Texel CD ROM drive, and a 3MB Orchid ProDesigner VLB graphics accelerator. We expected blazing performance, but our Tri-Star coasted to a subaverage showing. And there's no CPU upgrade path for the future. The 424MB removable hard drive is a nice touch, and Tri-Star throws in a superb 17-inch Mag monitor.

Support is solid, with a year of free on-site service and good toll-free support. Removable hard drives are expensive, and this is a solid PC with 424MB of fast, totable storage. (At press time, Tri-Star informed us of a price drop to $3995—considerably enhancing this PC's value.) *Tri-Star Computers, 602/961-3401.* **Reader service no. 694**

Unisys PW2 Advantage Plus Model 4666

STREET PRICE: $6792 **PROCESSOR:** Intel 486DX2-66 **PROS:** Ethernet adapter, CD ROM drive, 1.2GB hard drive **CONS:** Very high price, so-so service

You expect to pay for performance, but not almost $6800 for a fast DX2-66. This server/high-end PC has five 32-bit EISA slots (one occupied by an Ethernet card), a 1.2GB SCSI drive, and a Toshiba CD ROM drive.

You get 16MB of RAM (upgradable to 128MB), a 238-pin upgrade socket, and two free drive bays. One (major) minus for non-server use: The monitor supports SVGA resolutions—but not with flicker-fighting refresh rates. And Unisys service-and-support policies aren't optimum. For example, free tech support lasts just 90 days from purchase, although you do get a year of free on-site service. Though Unisys gives you a lot of system, we think premium price should be paired with premium service. *Unisys, 800/874-8647.* **Reader service no. 695**

USA Flex VL486DX2-66

DIRECT PRICE: $2995 **PROCESSOR:** Intel 486DX2-66 **PROS:** Multimedia setup, excellent service and support **CONS:** Single-speed CD ROM drive

The VL486DX2-66 comes with a 238-pin ZIF CPU socket, a 340MB hard drive, a CD ROM drive, a sound card, and speakers—at an affordable $2995. Unfortunately, the CD ROM drive is based on older single-speed technology. And you have to yank at least four 1MB SIMMs to upgrade beyond the standard 8MB.

Performance is subpar. USA Flex's service and support is strong, providing around-the-clock toll-free tech support. Responsiveness was immediate, and we got correct answers on all but one of our questions. You also get a year of free on-site service. Despite its extras, however, this USA Flex model doesn't provide the high-end performance we're looking for in this review. *USA Flex, 800/876-5604, 708/351-7204 (fax).* **Reader service no. 696**

Top-End Performance: Pentium Rules

	Word for Windows 2.0	Excel 4.0	Paradox 3.5 in DOS window	Freelance for Windows 1.0	BAPCo SYSmark92
ALR Evolution V Intel Pentium-60	82	56	81	84	275
IBM PC Company ValuePoint P60/D* Intel Pentium-60	79	54	100	88	217
Compaq Deskpro 5/60M Model 510 Intel Pentium-60	87	70	83	115	196
AcerPower Series 9000 Intel Pentium-60	85	70	81	106	171
NEC Image 466es Intel 486DX2-66	93	74	124	98	176
Gateway 2000 4DX2-66V* Intel 486DX2-66	94	71	124	101	164
Zeos 486DX2-66* Intel 486DX2-66	96	84	115	100	165
Nat'l MicroComputers Pro-System 466 Intel 486DX2-66	106	85	113	117	190
Acma 486/66/DX2 System Intel 486DX2-66	98	83	109	128	180
AST Premmia 4/66d Model 343W Intel 486DX2-66	98	85	119	112	169
Unisys PW2 Advantage Plus 4666 Intel 486DX2-66	104	79	119	109	154
Dell Dimension 466V/XPS* Intel 486DX2-66	103	87	113	100	150
Comtrade EISA VL-Bus Professional 66* Intel 486DX2-66	104	89	111	126	169
Ares 486-66DX2 EISA/VESA Intel 486DX2-66	105	86	141	120	187
Insight 486DX2-66 Smart Server Intel 486DX2-66	101	84	133	118	164
Netis N4D266VL* Intel 486DX2-66	108	94	117	133	164
Tri-Star 486DX2/66 VL Station Intel 486DX2-66	106	87	133	135	163
NCR System 3333 Intel 486DX2-66	104	91	143	107	140
Polywell Poly4586-66VC Intel 486DX2-66	109	96	107	126	131
Blackship BLK 486/66LB Intel 486DX2-66	111	93	142	126	150
CAF Master L737 DX2/66 Intel 486DX2-66	118	101	131	135	146
Diamond DT 486DX2-66 VL-SCSI Intel 486DX2-66	107	92	154	121	132
Tagram Concerto Hi-Note 486DX2-66 Intel 486DX2-66	117	98	163	128	139
USA Flex VL486DX2-66 Intel 486DX2-66	124	107	144	141	115
ALR Flyer VL 4/50d Intel 486DX2-50	155	116	183	151	153

*Best Buy

Systems arranged in order of overall speed, with fastest at top. Results are in seconds (lower is better) except for the BAPCo SYSmark92 results, given in number of scripts executed per hour (higher is better).

Methodology Systems were configured with DOS 6.0 and 8MB or 16MB of RAM. We configured Windows with a Hewlett-Packard LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We loaded the test applications and files, Microsoft Test automation software, and the test-automation scripts.

Word for Windows 2.0 We check spelling and scroll through a 27-page document; create, format, print, and save a one-page business letter; and open a business proposal, add a paragraph, then preview and print.

Excel 4.0 We do data extracts; build, format, and print a financial statement; open a mortgage analysis, scroll, move blocks, change the interest, print-preview, and save.

Paradox 3.5 in DOS window We perform a variety of data entry, searching, updating, and reporting tasks.

Freelance for Windows 1.0 We load a one-page starter file, enter text, add a page, and enter bulleted items. Then we add pages containing 3-D bar charts and import data from a WK1 file. We preview a slide show, applying various views, then save the presentation to disk.

BAPCo SYSmark92 We run a script that loads PageMaker 4.0, dBASE IV 1.1, Harvard Graphics 3.0, 1-2-3 3.1, Microsoft C 6.0, Excel 3.0, Word for Windows 2.0, Paradox 3.5, Quattro Pro 3.0, and WordPerfect 5.1 and executes a variety of typical tasks with each.

Data based on tests designed and conducted by the PC World Test Center except BAPCo SYSmark92, an industry-standard test developed by the Business Application Performance Corporation. **All rights reserved.**

FEATURES COMPARISON

High-End Pentiums, DX2-66s Pack Hefty RAM and Storage

● Yes
○ No
n/a = not applicable

	AcerPower Series 9000	Acma 486/66/DX2 System	ALR Evolution V	ALR Flyer VL 4/50d	Ares 486-66DX2 EISA/VESA	AST Premmia 4/66d Model 343W	Blackship BLK 486/66LB	CAF Master L737 DX2/66	Compaq Deskpro 5/60M Model 510/1020/w	BEST BUY Comtrade EISA VL-Bus Professional 66
Standard features										
Selling price as of 10/1/93[1]	$5800	$3495	$5088	$2906	$3295	$3967	$1995	$2495	$7200	$3295
CPU	Pentium-60	486DX2-66	Pentium-60	486DX2-50	486DX2-66	486DX2-66	486DX2-66	486DX2-66	Pentium-60	486DX2-66
CPU/upgrade socket	Pentium	238-pin ZIF	Pentium	238-pin	238-pin ZIF	238-pin ZIF	238-pin ZIF	ZIF 486DX2	Pentium	ZIF 486DX2
BIOS	Acer 7/1/91	AMI 11/11/92	Phoenix 1.02.01m	Phoenix 4/19/93	AMI 6/6/92	AST 10/22/93	AMI 11/11/92	AMI 11/11/92	Compaq 4/28/93	AMI 1/15/93
Installed/maximum RAM (MB)	16/128	16/32	16/128	8/36	8/256	8/128	8/64	8/32	16/136	8/128
30-pin or 72-pin SIMM chips	72-pin	30-pin	72-pin	72-pin	72-pin	72-pin	30-pin	30-pin	72-pin	30-pin
SIMM sockets/number free	4/0	8/4	4/0	2/1	4/2	4/2	8/0	8/0	4/0	8/0
Secondary cache installed/maximum (K)	256/1024	256/256	256/256	256/256	256/512	256/512	256/1024	256/256	256/256	256/256
Case style	desktop	tower	compact	pizza box	tower	compact	minitower	desktop	desktop	compact
Free externally accessible 3½-inch/5¼-inch drive bays	0/2	0/2	0/2	0/1	0/3	0/2	1/1	2/1	0/2	0/2
Free internal 3½-inch/5¼-inch drive bays	0/0	1/2	2/0	0/0	0/1	1/0	0/0	0/1	0/0	0/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	6/0/0	0/4/0	0/3/0	0/2/0	4/0/0	5/0/0	0/5/0	0/4/0	4/0/0	2/2/0
PCI or VL bus slots/number free[3]	2VL/1	2VL/0	3VL/1	1VL/0	3VL/1	0/0	2VL/0	2VL/0	0/0	2VL/1
Hard disk	Fujitsu M2691	Conner CP30544	Conner CP30544	WD Caviar 2250	WD Caviar 2340	WD Caviar 2340	Quantum Prodrive	Maxtor 7213AT	Conner CP3541	Conner CP30544
Size (MB)	520	544	544	256	340	340	244	213	510	544
Adapter	integrated SCSI	4MB OEM DC-680 VLB	4MB Promise DC-6880 VLB	1MB Promise DC-680 VLB	2MB Intelysis DC-680 VL Bus	integrated	Blackship OEM VLB	2MB Promise DC-4030 VLB	integrated	4MB DT C3290-ASE EISA SCSI
Floppy drives (MB)	1.44	1.2, 1.44	1.44	1.44	combo	1.2	1.2, 1.44	1.2, 1.44	1.2	1.2, 1.44
Graphics adapter	Diamond Viper VLB	Diamond Viper VLB	ATI Mach 32	integrated WD 90C33 local bus	Hercules Graphite	integrated ATI Mach 32	Cirrus Logic Mach Speed	Cirrus Logic Mach Speed	Compaq QVision	Diamond Viper VLB
Installed VRAM/DRAM (MB)	2/0	2/0	2/0	0/1	2/0	0/1	0/1	0/1	2/0	2/0
Monitor	AcerView 76i	Mag MX15F	ALR Flex-View 3xNI	ALR Flex-View 3xNI	CTX CPS-1560LR	AST SVGA LR	KFC CK1428A	CAF CN 1470	QVision 170	CTX CPS-1560LR
Screen diagonal (inches)/dot pitch (mm)	17/.28	15/.28	14/.28	14/.28	15/.28	17/.28	14/.28	14/.28	17/.28	15/.28
Modem fax/data speed (bps)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sound board	○	○	○	○	○	○	○	○	○	○
CD ROM drive	Sony 541	○	○	○	○	○	○	○	○	○
Sequential data-transfer rate (kilobytes per second)	150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Parallel/serial/mouse/ MIDI-game/audio/SCSI ports	1/2/1/ 0/0/2	1/2/0/ 1/0/0	1/2/1/ 0/0/0	1/2/1/ 0/0/0	1/2/0/ 1/0/1	1/2/1/ 1/0/0	1/2/1/ 1/0/0	1/2/1/ 1/0/0	1/2/1/ 0/1/0	1/2/1/ 1/0/1
Service and support										
Warranty (months)	12	12	60/15[7]	60/15[7]	24[8]	36	12	12	36	36
30-day money-back guarantee	●	●[12]	●	●	●[13]	○	●	●	○	●
On-site service price for first year	free	free	free	free	free	free	free	[14]	free	free
Turnaround policy (days at service center)	3	3	3	3	3	○	2	3	2	2
Weekday toll-free phone support (hours)	24	11	11	11	24	24	9	9[17]	24	12
Weekend support	●	○	●[19]	●[19]	●	●	○	○	●	●[19]
BBS	●	●	●	●	●	●	●	○	●	●
Fax	●	●	●	●	●	●	●	●	●	○

[1] All system prices includes DOS 6.0, Windows 3.1, SVGA, a color monitor, a keyboard, and a mouse. Selling price is direct or based on vendor estimate.

[2] Can use either two PCI cards/two ISA cards or one PCI card/three ISA cards.

[3] VL slots also accept 16-bit cards.

[4] Supplemented by 80MB Versadrive removable hard disk.

[5] Includes ethernet port.

[6] SCSI port needs optional SCSI host adapter chip to enable.

[7] 60 months parts, 15 months labor.

	BEST BUY Dell Dimension 466V/XPS	Diamond DT 486DX2-66 VL-SCSI	BEST BUY Gateway 2000 4DX2-66V	BEST BUY IBM PC Company ValuePoint P60/D	Insight 486DX2-66 Smart Server	Nat'l MicroComputers Universal Pro-System 466	NCR System 3333	NEC Image 466es	BEST BUY Netis N4D266VL	Polywell Poly4586-66VC	Tagram Concerto Hi-Note 486DX2-66	Tri-Star 486DX2/66 VL Station	Unisys PW2 Advantage Plus Model 4666	USA Flex VL486DX2-66	BEST BUY Zeos 486DX2-66
	$3318	$2799	$2995	$4999	$2799	$3404	$3695	$3510	$2385	$3985	$2520	$4595	$6792	$2995	$2932
	486DX2-66	486DX2-66	486DX2-66	Pentium-60	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66
	238-pin ZIF	238-pin ZIF	238-pin ZIF	Pentium ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	ZIF 486DX2	238-pin ZIF	238-pin ZIF	238-pin ZIF
	Phoenix 010A01	AMI 2/17/93	Phoenix 1/15/88	AMI 11/11/92	AMI 11/11/92	AMI 11/11/92	NCR 6/14/93	NEC 486ES 1.00.02	AMI 6/6/93	AMI 6/6/92	AMI 6/6/92	AMI 11/11/92	Phoenix 1.00.02	AMI 7/15/93	Phoenix 8/2/93
	16/64	8/128	16/64	16/128	8/32	16/64	8/64	8/128	8/32	16/64	8/32	16/32	16/128	8/32	8/64
	72-pin	30-pin	72-pin	72-pin	30-pin	30-pin	72-pin	72-pin	30-pin	72-pin	30-pin	30-pin	30-pin	30-pin	72-pin
	4/3	8/0	4/0	4/2	8/0	8/4	4/2	4/3	8/0	4/3	8/0	8/4	8/4	8/0	4/2
	256/256	256/512	256/256	256/256	256/256	256/256	64/256	256/256	256/256	256/256	256/256	256/256	128/256	128/256	256/256
	compact	desktop	desktop	compact	tower	desktop	minitower	compact	desktop	tower	minitower	tower	desktop	desktop	desktop
	0/2	1/1	0/2	0/2	4/0	0/2	0/2	0/2	0/2	0/1	1/0	0/1	0/2	1/2	1/1
	1/0	0/0	0/1	1/0	0/0	1/0	2/0	0/0	0/0	2/0	0/0	2/2	0/0	1/0	0/1
	0/5/0	1/3/0	0/5/0	0/3/0[2]	0/5/0	0/5/0	0/4/0	0/2/0	0/4/1	0/5/0	0/4/0	0/1/1	4/0/0	0/4/0	0/5/1
	2VL/1	2VL/0	2VL/1	2PCI/2[2]	2VL/0	2VL/0	2VL/1	2VL/2	2VL/0	2VL/0	2VL/1	3VL/1	0/0	2VL/0	2VL/1
	WD Caviar 2340	Seagate ST2383N	WD Caviar 2420 SCSI	WD Caviar 2420	WD Caviar 2340	WD Caviar 2340	WD Caviar 2340	WD Caviar 2420	WD Caviar 2340	WD Caviar 2420	WD Caviar 250	WD Caviar 424	Seagate ST11200N	WD Caviar 2340	Seagate ST3655A
	340	320[4]	424	424	340	340	340	420	340	425	250	424	1200	340	528
	integrated	Nextor NXt-82 VLB	integrated VLB	integrated	OEM VLB	4MB Promise DC-4030 VLB	integrated	integrated	2MB Promise DC-4030 VLB	Morse 8020 IDE Blazer VLB	BCM Advanced Research	4MB Promise DC-680 VLB	integrated SCSI	Data Technology DTC-2272 VLB	integrated
	combo	1.2, 1.44	1.2	1.44	1.2, 1.44	combo	1.2	1.44	1.2, 1.44	1.2, 1.44	1.2, 1.44	combo	1.44	1.44	1.2, 1.44
	Diamond Viper VLB	WD Paradise	ATI Ultra XLR	integrated PCI-ATI/68800	Boca SVGA XL1	STB Pegasus VL	Diamond Viper VLB	integrated local bus	Diamond Viper VLB	No. 9 Computer Co. GXE	BCM Advanced Research	Orchid P9000VLB	integrated ATI 68800	ColorDesigner Local Bus AVGA3B	Diamond Viper VLB
	2/0	0/1	0/2	1/0	0/1	4/0	2/0	0/1	2/0	2/1	0/1	2/1	1/0	0/1	1/0
	Dell UltraScan 15FS	CTX CMS-1461	Crystal-Scan 1572FS	IBM	Mag MX17E	MicroScan Model 46	NCR Ergonomic	NEC 4FGe	ETC Model CA-1565	MicroScan 4G ADI	Proton	Mag MX17F	Unisys	CTX CVP-5468NI	Zeos color VGA
	15/.28	14/.28	15/.28	15/.28	17/.28	15/.28	15/.28	15/.28	15/.28	15/.28	14/.28	17/.26	14/.28	14/.28	14/.28
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	○	●	○	○	●	○	○	○	○	LaserWAVE Supra 16	Voyetra Audio 16	○	○	Axtech NX Stereo Pro	○
	○	○	Mitsumi	○	○	○	○	○	○	OEM CR562-B	OEM CR562-B	Texel/DM-3024	Toshiba XM3401B	Mitsumi	○
	n/a	n/a	300	n/a	n/a	n/a	n/a	n/a	n/a	300	300	320	150	150	n/a
	1/2/1/1/0/0	1/2/1/1/0/1	1/2/1/0/1/0	1/2/1/0/0/0	1/2/1/1/0/0	1/2/0/1/0/0	1/2/1/0/0/0	1/2/1/0/0/1	1/2/1/1/0/0	1/2/0/0/0/0	1/2/1/1/1/0	1/2/1/1/1/0	1/2/1/1/0/1[5]	1/2/1/0/1/0	1/2/0/0/0/1[6]
	12	15/24[9]	12	12	12	12/24[10]	36	36	12	24/60[11]	24	24	12	12	12
	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●
	free	$75	free	free	[14]	$39	free[15]	free[16]	$80	$75	free	free	free	free	$49
	7	2	○	○	3	1	1	○	2	3	1	7	○	2	3
	24	9	18	24	24	9	24	12	10	9	11	11	8[18]	24	24
	●	●[19]	●[19]	●	●	○	●	○	●[19]	●[19]	●[19]	○	○	●	●
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●

[8] Lifetime labor warranty.
[9] 15 months parts, 24 months labor.
[10] 12 months parts, 24 months labor.
[11] 24 months parts, 60 months labor.
[12] 45-day money-back guarantee.
[13] 60-day money-back guarantee.
[14] No on-site service option.
[15] Free for 36 months.
[16] $75 per year for second and third years.
[17] Not toll free.
[18] 90 days free tech support.
[19] Saturday only.

Superior In E

Every Nanao monitor undergoes intense scrutiny and testing to ensure maximum performance and product reliability. Our quality control processes and technical standards are among the most rigorous in the industry.

Our new line of Ecological Design™ Monitors incorporates advanced energy-saving features including PowerManager, which cuts power as much as 93% when the monitor is not in use. (After Dark screen saver software free with each monitor.)

Nanao was the first monitor company to join in partnership with the EPA Energy Star Program. Our commitment to bring technical innovation to today's environment ranges from eliminating CFCs in our manufacturing process to using recyclable packaging and paper products.

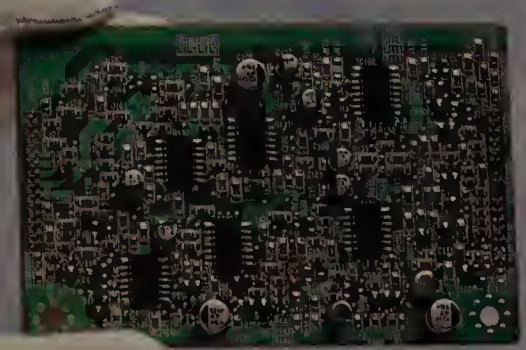
Nanao FLEXSCAN technology is compatible with all of today's popular graphics cards, offering a viewing environment ranging from enlarged graphics to multimedia.

MPR II

Nanao's FLEXSCAN family of monitors meets safety specifications for radiation emissions established by the Swedish MPR-II guidelines as well as those of TCO, the Swedish Confederation of Professional Employees. Nanao was the first monitor manufacturer to achieve FCC Class B approval for our 80kHz frequency monitors.

REDUCED ELECTROMAGNETIC FIELDS TCO 1992 AUTOMATIC DISPLAY POWER DOWN

High quality PCB boards are assembled, adjusted and inspected at Nanao's special chip-mounting factory. All PCB boards are built using sophisticated surface-mount technology.



Model	Size	Dot Pitch	Scan Frequency	Recommended Resolution
T660*i*	20"	0.30mm	H:30-82kHz V:55-90Hz	1280x1024
T560*i*	17"	0.25mm	H:30-82kHz V:55-90Hz	1280x1024
F760*i*-W	21"	0.31mm	H:30-78kHz V:55-90Hz	1280x1024
F560*i*-W	17"	0.26mm	H:30-82kHz V:55-90Hz	1280x1024
F550*i*-W	17"	0.28mm	H:27-65kHz V:55-90Hz	1024x768
F340*i*-W	15"	0.28mm	H:27-61.5kHz V:55-90Hz	1024x768

Nanao T-Series and F-Series monitors have captured every major award.

very Detail.

Our high resolution CRTs deliver a complete range of color displays with photographic quality and brilliant color images to sophisticated applications like CAD, DTP and multimedia. TRINITRON® CRT models offer greater precision and intricate detail, while Nanao's Invar Shadow Mask Flat Screen CRT models provide a wide display area and lower distortion image. Both CRTs feature our unique built-in Dynamic Beam Spot Control System that ensures maximum brightness and sharp focus.

A heritage of precision craftsmanship and attention to detail has been designed into Nanao's family of display monitors.

To reduce glare, eliminate static electricity, and improve the focus level on the display area, Nanao has developed two anti-reflective innovations: ErgoCoat,™ a protective coating for all F-series monitors, and ErgoPanel,™ a sturdy panel that covers the surface of our T-series monitors.

Our user-friendly front control panel incorporates ergonomic design and ease-of-use as well as a variety of powerful options for customizing images.

At Nanao, details make all the difference in creating our family of professional display monitors. From the product design and manufacturing that takes place in our factory to the end user's working environment, Nanao pays attention to every detail. In engineering. Assembly. Product testing. Quality control. Shipping. Customer support. From the very first days of the company, we set out to be an innovator in monitor technology. And, in a few short years, we have achieved that goal. Today, Nanao has the lowest repair rate in the monitor industry, the highest product reliability, and a fast-growing number of enthusiastic customers. So if you're looking for a superior monitor, start with the details. We do.

NANAO®

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679

1-800-800-5202

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Circle 194 on reader service card

Win a Gateway 486DX2-66

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Gateway 2000 4DX2-66V, a Best Buy featured in this month's system review.

HOW TO ENTER: Fax your completed questionnaire, along with your name and phone number, to *PC World* at 415/267-1779. If you have trouble connecting to this number, fax your survey to 415/974-7404 or 415/442-1891. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 1-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107. Send your survey in no later than January 31.

HOW TO FILL OUT THE FORM: FOR BEST RESULTS, PHOTOCOPY THIS PAGE; DO NOT TEAR IT OUT. Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person per month. Void where prohibited by law.

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○	○

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Ambra ○ Apple ○ AST ○ Austin ○ Axik ○ Blackship ○ Canon ○ Compaq ○ CompuAdd ○ Compudyne ○ CompuTrend
○ Cornell ○ DEC ○ Dell ○ DTK ○ Epson ○ Everex ○ Gateway ○ Grid Systems ○ Hewlett-Packard ○ Hyundai ○ IBM ○ Insight ○ Leading Edge ○ Micro Express
○ Micron ○ MIS ○ Mitac ○ NCR ○ NEC ○ Northgate ○ Packard Bell ○ Panasonic ○ PC Brand ○ Samsung ○ Sharp ○ Swan ○ Tandon ○ Tandy
○ Tangent ○ Texas Instruments ○ Toshiba ○ Tri-Star ○ Twinhead ○ Unisys ○ USA Flex ○ Wang ○ Wyse ○ Zenith ○ Zeos ○ Other (specify): _____ _____

Is this PC a...?
○ Desktop
○ Notebook/laptop
○ Hand-held

Is this PC a...?
○ Pentium/586
○ 80486
○ 80386
○ 80286
○ Other (specify): _____

Where did you purchase this PC?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home/electronics store
○ Retail store
○ VAR
○ Other (specify): _____

When did you buy this PC?
○ This month
○ 1–3 months ago
○ 4–6 months ago
○ 7–12 months ago
○ More than 12 months ago
○ Not sure

Would you buy this brand of PC again?
○ Yes
○ No

Do you use this PC at...?
○ Work ○ Home ○ Both

In terms of PC skills, would you describe yourself as...
○ Novice ○ Intermediate ○ Experienced

WHAT ARE YOU REPORTING? (Check only one.)

○ No problems ever
○ No problems since last responded to survey
○ A problem since last responded to survey
○ An older problem not previously reported in this survey

If you're NOT reporting a problem, please fill out the Uptime Report (below).

To REPORT a problem, fill out the Problem Report (right column).

UPTIME REPORT

How many consecutive months has your PC been trouble-free?

○ 3 months ○ 6 months ○ 9 months ○ 12 months ○ 15 months ○ 18 months ○ More than 18 months

■ **STOP HERE if you're not reporting a problem.**

PROBLEM REPORT

When you first received your NEW PC, was any component "dead on arrival"?
○ Yes ○ No ○ Don't know

If so, which one was it? (Check all that apply.)
○ Battery ○ CD ROM ○ CPU ○ Floppy drive
○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory
○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse
○ Power supply ○ Sound board ○ Other

■ **For the following questions, describe your most recent HARDWARE-related problem with this PC.**

Did you contact the manufacturer for repair service or technical support?
○ Yes
○ No
○ Not sure

What was this problem finally identified as?
○ Faulty component
○ Incorrectly installed software
○ Wrong configuration
○ Faulty peripheral
○ Device conflicts
○ OS problem
○ Other
○ Don't know

If a component failed, which one was it? (Check all that apply.)
○ Battery ○ CD ROM ○ CPU ○ Floppy drive
○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory
○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse
○ Power supply ○ Sound board ○ Other

How many times have you had a problem with this PC?
○ This was first time ○ Two ○ Three ○ Four ○ More than four

Did the problem occur under warranty?
○ Yes
○ No
○ Not sure

How recently did this problem occur?
○ This month
○ 1–3 months ago
○ 4–6 months ago
○ 7–12 months ago
○ More than 12 months ago
○ Not sure

How long after PURCHASE did this problem occur?
○ Less than 1 month
○ 1–3 months
○ 4–6 months
○ 7–12 months
○ More than 12 months
○ Not sure

■ **For the following questions, describe your most recent SERVICE or SUPPORT experience.**

What type of service/support did you receive?
○ Phone ○ On-site ○ In-store help
○ Express system swap ○ Express component swap ○ Factory return

If phone service, how long were you on hold?
○ Not at all ○ Less than 1 min. ○ 1–2 min. ○ 2–5 min. ○ 5–10 min. ○ 10–20 min. ○ More than 20 min.

How long did it take before you talked to the person who finally helped you?
○ Less than 1 hour ○ 1–24 hours ○ 1–2 days ○ 3–5 days ○ 1 week ○ More than 1 week

How long did it take to resolve the problem completely?
○ Less than 1 week ○ 1–2 weeks ○ 3–4 weeks ○ More than 1 month ○ Never resolved

Was the problem resolved to your satisfaction?
○ Yes ○ No

Based on the service and support you received, would you buy this brand of PC again?
○ Yes ○ No

On the whole, how satisfied were you with the service and support you received?
○ 1 ○ 2 ○ 3 ○ 4 ○ 5
Not at all — Satisfied — Extremely satisfied

How likely is it that you would recommend this brand of PC to a friend or colleague?
○ 1 ○ 2 ○ 3 ○ 4 ○ 5
Not at all — Likely — Extremely likely

PLEASE FAX TO 415/267-1779

Free house calls.

Full coverage.

No deductibles.

Health care reform for PCs

NCR
An AT&T Company

Just What The Doctor Ordered.

A worry-free warranty for three full years.

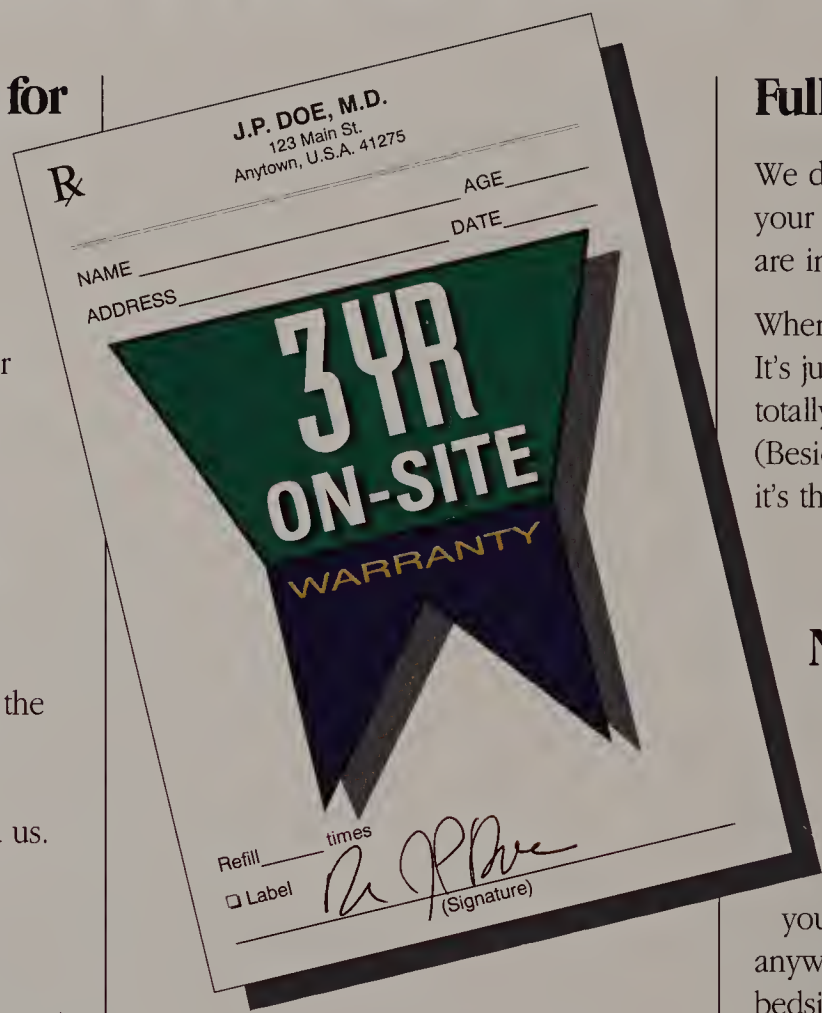
You've got enough worries without having to figure out how to get your PCs fixed. Thanks to NCR, life just got simpler due to our world-class warranty protection.

Only NCR desktop PCs come with a three-year, on-site warranty.

Our desktop warranty is the best in the industry. There's no fine print. No exceptions. Just an old-fashioned promise to be there when you need us.

Free house calls.

House calls for three years? Hard to believe. But what else would you expect from AT&T/NCR? Fact is, we make it down right easy. We come directly to you the next business day. We're there when you need us and not just for the first year...we'll come to you for THREE FULL YEARS.



Full coverage.

We don't scrimp when it comes to getting your PC back on its feet. Parts and labor are included. So's the monitor.

When we say "full coverage" we mean it. It's just one more way to show you we're totally committed to your satisfaction. (Besides, with our product reliability, it's the least we could do.)

No deductibles.

Our desktop warranty has no hidden costs, no upfront service fees. It's absolutely free.

Just think of NCR's warranty as your prescription to the best care anywhere in the United States. (And our bedside manner is darn friendly, too.)

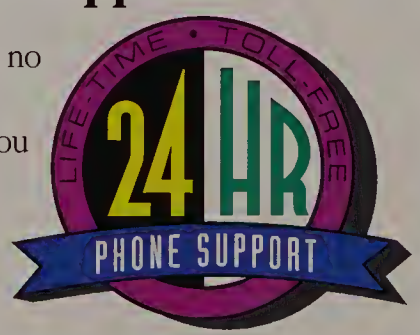
Premium Services.

Superior Support From NCR Service Specialists.

We've been around long enough to know that when something goes wrong, it's important to have someone on-site who knows your system inside and out. That's why we insist on having our own dedicated support staff.

Our warranty is a real dollars and cents commitment to you. It covers all U.S.-installed equipment. We don't expect our systems to bring you anything other than tremendous satisfaction. We've staked our reputation and resources on their quality by giving you a true benchmark for comparison.

24-Hour Toll-Free Techline Support.



That means no more late nights for you at the emergency room. Just call our Techline. It's toll-free, twenty-four hours a day. You'll talk with some of the best-trained folks in the business who will help get your system up and raring to go.

Ask about our 30-Day, no-questions-asked Money-Back Guarantee.

The best way to appreciate an NCR system is to put it through its paces. And, if in a month's time, you find it's just not for you, send it back. We'll refund your money. No questions asked.

We don't want to just satisfy you. We want to delight you.

There's just too much at stake.
A system that meets your needs.
A hard-won reputation for us.

So, we'll do whatever's necessary to make sure your system stays healthy for the days and nights ahead.

AT&T/NCR technology, a worry-free desktop warranty, and superior support services...

Just what the doctor ordered.

(No appointment necessary.)

Healthy Choices.

NCR 486SX/25

$995

Special Call Now! Offer

- ***Intel486 OverDrive Ready***
- Intel486SX/25 (upgradable to 50MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 120MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- 1MB Video RAM
- 14" SVGA VESA Flicker-Free .39mm Monitor

Super 486 Power For Under $1,000! Hurry! Limited Quantities Only!

NCR 486SX/25

$1,290

or $46/month

- ***Intel Pentium OverDrive Ready***
- Intel486SX/25 (upgradable to 50MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 120MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .39mm Monitor

Performance on a Budget!

NCR 486SX/33

$1,510

or $1,700 (w/486DX/33)

- ***Intel Pentium OverDrive Ready***
- Intel486SX/33 (upgradable to 66MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 160MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .28mm Monitor

Great For Home Or Office!

NCR 486DX2/50

$2,320

or $83/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/50
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 240MB Hard Drive (expandable to 2GB)
- 8MB RAM at 70ns (expandable to 64MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .28mm Monitor

Outstanding Business Workhorse!

NCR 486DX2/66

$3,510

or $119/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 340MB Hard Drive (expandable to 2GB)
- 12MB RAM at 70ns (expandable to 64MB)
- 64KB External Cache (upgradable to 256KB)
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Diamond Viper Video (Weitek P9000) w/2MB Video RAM
- NEC 15" SVGA VESA Flat Screen .28mm Monitor

Graphics Powerhouse!

NCR 486DX2/66

$3,405

or $115/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 520MB Hard Drive (expandable to 2GB)
- 16MB RAM at 70ns (expandable to 64MB)
- 256KB External Cache
- 3.5" Floppy Disk Drive
- Upgradable to VESA Local Bus Video
- SVGA Server Video (Cirrus 5422) w/512KB Video RAM
- 14" SVGA VESA Flicker Free Screen .39mm Monitor

Fantastic File Server!

All NCR Desktop Systems Include:

Microsoft Mouse, Windows 3.1, MS DOS 6.0

Options:

- CD-ROM
- Fax/modems
- Networking cards
- Memory/disk upgrades
- Printers
- A variety of popular applications

intel inside

Microsoft Windows Ready-To-Run

Demand the best. Only with NCR.

- Next business-day service and 24-hour Tech support.
- Free 3-year on-site warranty – parts, labor and monitor included.

AT&T

NCR
An AT&T Company

Call NCR Direct Connect: 1-800-462-3855

NCR products are available through Direct Connect or through your local reseller. Call 1-800-624-7187 for the reseller nearest you.

Healthy Choices For Active People.

Hit the highway with our Road-Ready Systems. They're part of our Mobile Networked Computing strategy that combines NCR's innovative portable technology with AT&T's global communications leadership, like AT&T EasyLink™ Services, a portable communications network. Our notebooks are smaller, lighter, faster and better-connected than ever before.

Safari 3150

Special Call Now! Offer

Mono
$1,995
FREE 14" Color ESVGA Monitor!
(with 120MB HD Mono Model only)

Mono
$3,280
or
$111/month

Passive Color
$2,995
(Call now for price and availability on active color)

Active Color
$4,420
or
$149/month

- Intel486SX/25 (upgradable to 487)
- 120MB Removable Hard Drive (80MB and 170MB available)
- 3.5" Internal Floppy Drive
- 3-4 Hour Battery-life
- 6.1 lbs. (5.5 mono, 6.3 active color)
- 11"x 8.6" x 1.9" (11" x 8.6" x 1.7" mono)
- 9.5" Double-scan Passive Color Screen (TFT Active color and mono also available)
- 4MB RAM (upgradable to 20MB)
- 1MB Video Memory (mono and active 512KB)
- 1 PCMCIA slot (Type 2)
- Local Bus Video
- Dual Video Display
- Front-mounting Cableless Trackball
- Lightweight AC Adapter
- Enhanced Pre-loaded Software: DOS 6.0, Windows 3.1, Bitfax, Tourguide, AT&T Mail, AccessPLUS and on-line Windows documentation
- 3-year Warranty (first year on-site)

Road-Ready accessories

- **AT&T Keep in Touch PCMCIA Modem 14400 data/9600 fax, cellular ready**
- **DataRace™ PCMCIA Modem 2400 data/9600 fax**
- **Cellular Phone Interface Cable**
- **PCMCIA Network Interface Cards: 10BaseT, 10Base2 and WaveLAN**
- **Xircom Network Interface Adapters: 10BaseT, 10Base2 and 10Base5**
- **External Battery Charger**
- **Auto Adapter**
- **Extra Batteries, Hard Drives, Carrying Cases, RAM and Other Accessories Available.**

Safari 3180

- Intel486SL/33
- 180MB Removable Hard Drive (250MB available)
- 3.5" Internal Floppy Drive (can be replaced w/2nd battery)
- 3-6 Hour Battery-life (upgradable to 12)
- 6.8 lbs. (6.1 mono)
- 11.7" x 9.3" x 2.1"
- 9.5" TFT Active Color Removable Screen or 9.4" Mono Screen
- 4MB RAM (upgradable to 12MB)
- 1MB Video Memory
- 2 PCMCIA Slots (Type 2) or 1 Slot (Type 3)
- Local Bus Video
- Dual Video Display
- Trackball
- Lightweight AC Adapter
- Enhanced Pre-loaded Software: DOS 6.0, Windows 3.1, Bitfax, Tourguide, AT&T Mail, AccessPLUS and on-line Windows documentation
- 3-year Warranty (first year on-site)

Order AT&T/NCR. We've Made It Easy.

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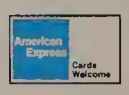

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Are You Ready for Mass Market PCs?

Attention, shoppers: Phones, TVs, VCRs, and computers are on aisle 4, behind bedding. Look for the red-tag specials. By Joe Abernathy

First it was the computer superstore. Then came office-supply depots and home-electronics stores. Now even Wal-Mart and Target are getting into the act. Never before have consumers had so many opportunities to save money—or spend money on the wrong product.

Almost every major PC company is courting mass-market retailers, once the almost exclusive domain of Packard Bell,

IBM's PS/1 line, and a motley array of third-tier clones. Dell, Compaq, IBM, Apple Computer, and AST have all signed contracts to sell their systems through these stores. You'll now find computers on the shelves next to stereos, phones, and TVs at membership clubs, home-electronics stores, office supply warehouses, discounters, and mass-market retailers.

"There have been more changes in how computer products are bought and sold in the past 18 months than in the first 12 years of the PC industry," says Bruce Frederickson, president of Channel Tactics. The Gold River, California, company advises some of the biggest PC companies on how they can survive and succeed in this new marketplace.

It's easy to see what's driving the shift. The so-called mass market represented $3.12 billion in sales for PC companies in 1992, according to Dataquest, a market research firm in San Jose, California. The market is growing so quickly, in fact, that Compaq, whose PCs weren't sold through mass retailers until June of last year, expected mass-market sales to account for 25 percent of 1993 revenues.

No Frills, No Fuss

Buying a computer at Circuit City or Wal-Mart is not the same, however, as buying from a traditional computer store or from a computer superstore.

The so-called mass merchants promise out-of-the-box solutions, complete with preloaded software and an easy-to-understand interface that takes the mystery out of Windows. No more hard sells or technobabble from a condescending salesperson. And no more driving across town to a *computer* store. Now you can shop for your PC at the same place you go to buy your fridge, stereo, or paper towels and cereal.

That's the promise. But buying a PC through a mass merchant isn't without problems. Salespeople—when you can find them—are usually poorly trained, which can lead to inappropriate recommendations. And many of the available models are older units, without the latest technology.

Buyers and analysts who follow the retail market say price is the most important factor in determining where people buy computers. "I shopped around for the best price on the system I wanted," says Larry Johnson, a corrections officer in Canon City, Colorado. Johnson finally found the best deal on his Packard Bell PackMate 20 at Pace Electronics.

A survey of 1200 shoppers conducted last year by Merrin Information Services of Palo Alto, California, confirmed that price was the number one reason PC buyers gave for shopping at superstores, home-electronics stores, and office-supply stores. Though discount retailers, such as Wal-Mart, and membership clubs weren't included in the survey, analyst Laura Curran believes the same point holds true with these segments.

No more technobabble from a condescending salesperson. And no more driving across town to a computer store. Now you can shop for a PC where you buy your fridge, stereo, or paper towels.

You're on Your Own

Low prices and shopping convenience sometimes come at the expense of service, which is notably absent at most mass merchandisers. PC companies acknowledge that buyers are often on their own when they walk into a mass retailer to buy a PC, and they have devised different strategies to help computer buyers make the right choice.

Inviting and informative shelf displays promote the computers' many features (usually with tear-off specification sheets). Innovative packaging (complete with preinstalled software and splashy promotions) targets home and small-business users. Some PC makers have also designed innovative self-running demos that walk users through a machine's features.

These additions are certainly a step in the right direction, but in many stores the machines are turned off or display only a DOS prompt or a cryptic message requesting a password. Hardly the friendly welcome to which vendors aspire.

And some of the displays are misleading. Leading Edge, for instance, includes brochures promoting the "WinPro 486—Now you can afford a computer that does Windows." But it just barely does Windows: It's a 25-MHz 486SLC machine with no math coprocessor, 2MB of RAM, and a 107MB hard drive. It "supports resolutions up to 1024 by 768," according to the literature, but nowhere in the friendly display does it say you'll have to add video memory before these resolutions are supported.

IBM is guilty of the same thing. Advertising "power at a price you can afford," the display for the PS/1 Essential, model 2133-W45, seems to proclaim that finally, here is the business-class powerhouse you've dreamed of. But after reading the specs, you'll find the same relatively low-level system: a 486SX-25 with 2MB of RAM and a 129MB hard disk.

These products will likely satisfy many first-time buyers. But as users become more proficient and demand more from their systems, some will inevitably find these solutions inadequate. The result? Disillusioned and dissatisfied customers who have plunked down more than $1000 only to find they've outgrown their systems.

More Power

Apple Computer, whose Performa line typically claims one-quarter of the shelf space in mass merchants, confirms that customers have been asking for machines with more power. "People want more performance and more software," says Apple spokeswoman Gilda Raczkowski. New Performa models launched in October 1993 contained from $800 to $1500 in bundled software, along with hotter hardware configurations that more closely resemble Apple's high-end products.

Packard Bell, which has been in the mass market longer than anyone, also claims to have learned a lesson about underpowered machines. With shipments of 624,000 computers in 1992, Packard Bell now offers more than 100 models.

"We were the first mass marketer to do local bus video," says Mal Ransom, vice president of marketing for Packard Bell. "Another good example is multimedia; we did it in 1992, whereas our competitors are just coming out with it now. We are very involved in bringing out the latest technology as soon as possible.

It's Just a Computer

Vendors claim computers are so easy anyone can use them. Are they? We located a 'digital idiot' and asked him to try out the new Compaq Presario. Here's what he found.

By Daniel Pinkwater

A brand-new computer! Oh joy! New things to learn. New, bewildering Instructions to follow. Ordinarily, I'd rather be shot.

Ever since I discovered that you can buy preformatted disks, I've had no need to venture out of my kiddie word processor into the hostile darkness of DOS. I've always known there was more up-to-date stuff to be had, but I still remember how much time it took to make the step from typewriter to computer, and I don't want to suffer anything similar.

So it was with trembling fingers that I clawed open the carton containing a brand-new Compaq Presario 425 (having been carefully chosen for this assignment as the nation's most perfect, or nearly perfect, digital idiot). If I could set this baby up and learn to work it, then lower animals—and maybe fish—could do it, too.

The machine was a beauty. Nice keyboard. Big screen—in color yet! And true to its name, it was compact, not much bigger than the monitor alone. Everything about it bespoke quality and thoughtful design. Hot dog! I was excited.

The setup went without a hitch. A four-page illustrated brochure called "Get started with your computer in eight easy steps!" showed where to plug everything in. I pressed the On button (Step 7).

The only exciting part was Step 8, where you pick a language from among all known human tongues. A not-that-prominent information bar reads: "Language selection is final. All other languages are removed." Miss that or hit a wrong key, and you may get: *Sprachenauswahl ist blebend. Alle andered Sprachen werden bei der Konfiguration gelosht.* Gelosht! I suppose, if you see that prompt, you've got no choice but to start looking around for a guy named Klaus to sell the thing to.

I got through the language choice okay. I chose English. It was a chicken choice because I already know that language, but the purpose of the exercise was to see how easy or difficult it would be for someone like me to get into this nifty state-of-the-art machine, coming as I do from the daily routine of an antediluvian PC, DOS 3.2 (not that I ever use it, mind you), and PFS:Write.

While the machine was loading programs and teaching itself English, I looked everywhere for the comic-book–style manual, maybe even with pictures of a friendly dog who would guide me through the mysteries of Windows. This book was not to be found. An oversight?

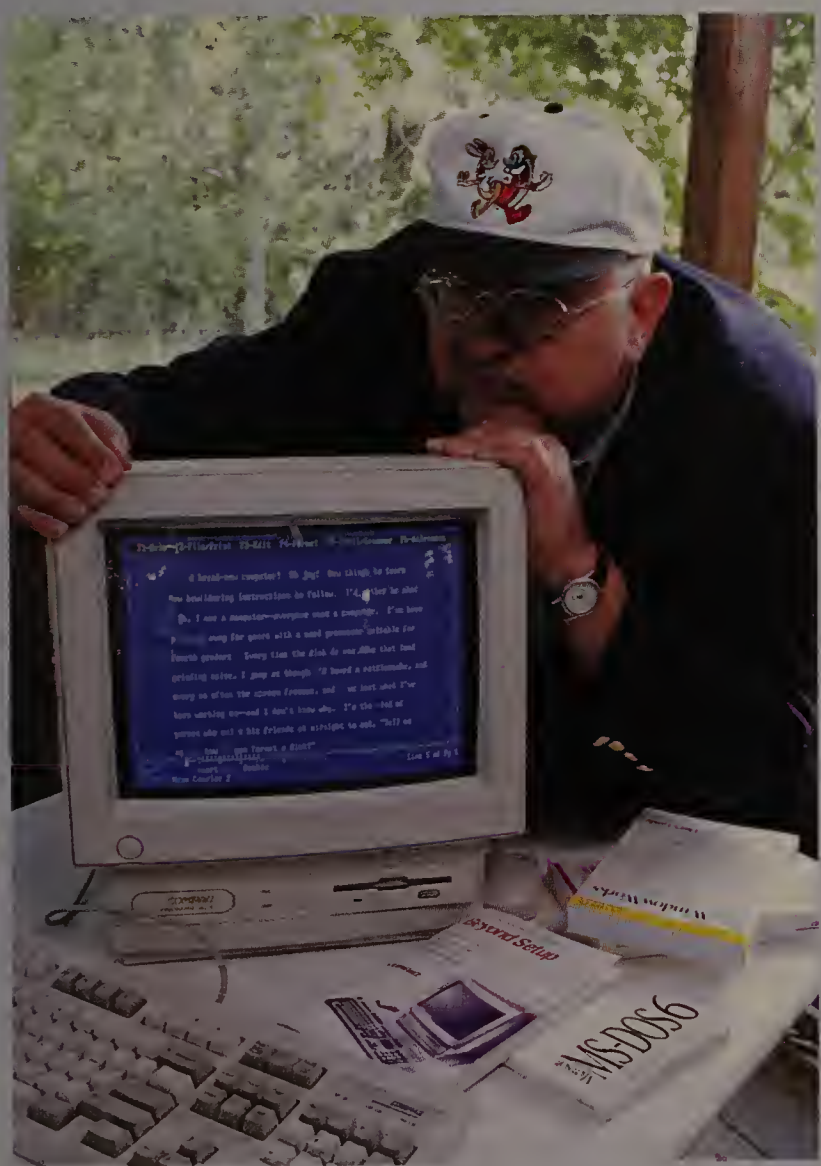
I decided not to read any of the manuals, aside from the eight-step brochure. The machine had to do all the indoctrination and teaching, or else what was the big deal? All computers come with volumes of hard-to-read manuals.

After an hour of hunt and peck, I finally blundered my way into an on-screen tutorial, and it was inadequate. Mostly I found a lot of perplexing advice about things like installing passwords. The tutorial assumed I knew something about the various features and programs on board, which I didn't and still don't.

Years ago, I worked with the first available Macintosh. It was slow and feeble and friendly. It came with an audiocassette of male and female voices talking through the process of learning the machine. They assumed I knew nothing and had never touched a computer.

Compaq, on the other hand, doesn't make this assumption. In fact, the only difference between buying the Presario and going to a computer shop where the technician loads everything is that the Presario installs everything anybody could ever need all by itself the first time you press the button. After that, it's peel the shrink-wrap off the manuals and settle down to a couple of weeks reading and learning. I'd love to do that, but who has the time?

I wound up buying the machine. It has a nice keyboard and a terrific screen, plus it's a lot faster than my old machine. With some help from a friend, I altered the AUTOEXEC.BAT file so, when I switch it on, It bypasses Windows and goes straight to my very own word processor. Maybe some rainy afternoon when I feel like avoiding work, I'll break out the manuals and find out what this little wonder can do.



DANIEL PINKWATER HAS WRITTEN 50 books for children and several popular books for adults. He is also a regular commentator on National Public Radio's "All Things Considered."

KATHY McLAUGHLIN

"Our buyer is somebody who walks into a warehouse club. But he doesn't want last year's technology," says Ransom. "At a mass merchandiser, the computer is presented as a complete offering, not as a mix-and-match situation."

PC World found, however, that it's still easy to bring home dated technology bearing Packard Bell's logo. In the mass-merchant stores we visited, many machines were clunky 386s. And even on the 486 machines, compromise was nearly inevitable. CD ROM drives, for instance, were 2-year-old, slow models, whereas new dual- and triple-speed drives rule the computer superstores. The computer sound available in the mass merchandisers was typically an 8-bit SoundBlaster—even though 16-bit is the growing standard—with dime-store speakers.

As Easy As...

One area of Packard Bell expertise may help balance the equation, however. After defining the mass market for computers in 1987, the firm pioneered a number of approaches to ensure consumers had a pleasant experience, which is a key consideration for first-timers.

When the Presario was released, Compaq was still ironing out the wrinkles in its Welcome Center, but Packard Bell systems already contained a custom Navigator front end that introduced users to their new computer. While Apple unveiled a box insert to walk new owners through setup, Packard Bell systems already contain a box-top sheet with the same information.

"Ease of use, plug and play, [these] are buzzwords, but they are things that we have done for a long time," says Ransom of Packard Bell.

Dell Computer in Austin, Texas, brings the customer and the company together before the sale is made. With its before-and-after-the-sale 800 number, Dell wants to make sure people buy the right computer to begin with, rather than fix a problem later. Dell also makes it harder to buy the wrong machine: The low-cost Dells sold in Sam's Club are the same machines sold to sophisticated mail-order buyers, with fewer frills and lower prices. Because of this, you can add the best multimedia package later, rather than finding yourself with a machine that doesn't meet your needs in six months.

Yes, but Are They any Easier?

There is some concern whether machines such as the Presario and Apple's Performa family may promise more to beginners than they can deliver. Although the Presario is one of the most accessible Windows machines available, a novice who reviewed the machine for us was lost once he landed in the Welcome Center, the gateway to Windows. (See the sidebar, "It's Just a Computer.")

"[We] need to educate the consumer and answer the question, 'Now that it is up and running, what should I do with it?'" says Compaq's Gian Carlo Bisone, vice president of marketing for Compaq North America. He adds that Compaq's surveys indicate that most potential Presario buyers have some computer experience.

"Our overall strategy is to push the envelope on ease of use," says Bisone. "We are testing internally what the best metaphor is to welcome people into a home computer," he adds, noting that ease of use and reliability are primary areas of focus and change.

"This market has three major attributes, and the first is a certain uneasiness with technology," Bisone notes. "So our name brand—Compaq—is very important. Second, support is a key ingredient; so the three-year warranty and seven-days-a-week, 24-hours-a-day support [policy] are very important. The third element is ease of use and setup."

Compaq offers an industry-leading three-year, on-site warranty. By calling a toll-free number, customers can get support for any aspect of the product, including the bundled software. Dell lacks the three-year warranty, but all their customers receive the same Dell phone support—regardless of where they buy their machines (a welcome change from the company's earlier policy of offering less comprehensive telephone support packages to customers who bought their computers through mass-market retailers). IBM also offers toll-free product support, which is becoming a welcome standard in the mass market.

Educating the Retailers

One problem 800 numbers can't solve, however, is people buying a computer that doesn't meet their needs. An educated sales force in retail stores would help.

Larry A. Berk, divisional merchandise director of hardware for Computer City, says manufacturers need to work much harder to understand the business. "The industry generally ought to be pretty embarrassed by how unsophisticated they are in selling in this environment," he says.

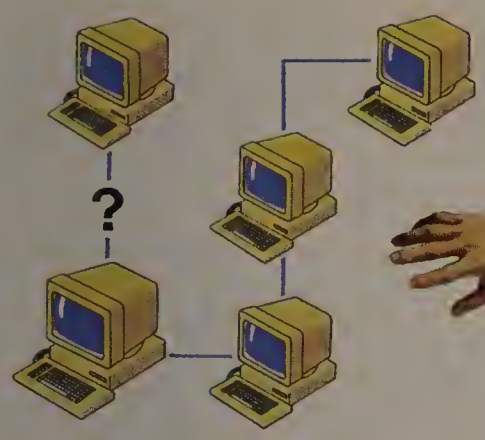
The need to do more is not lost on the industry. In fact, this void has sparked another new industry: Specialists called temp reps visit stores and educate the salespeople in how to sell computers. Alan E. Hall, president of Technology Advancement Corporation in Ogden, Utah, pioneered the practice, working with nearly every major hardware and software vendor.

In the past few months, Hall says, more and more of his company's time has been spent in the mass merchandisers. "Traditionally the temp rep has focused on the MicroAge-type stores, mom-and-pop shops, and chains such as Egghead, and we still do that," says Hall, whose company demonstrates and trains salespeople on everything from spreadsheets to PS/1s. "But now the general merchants like Sears and Wal-Mart are handling computer products, and we're going in there and beginning to educate some of those salespeople," he says.

According to Hall, salespeople in the mass merchandisers have little technical expertise and gladly welcome the assistance. "They don't want to look like idiots [when customers ask them questions,]" says Hall.

"In a regular old computer store, the salespeople know what a hard drive is. But when you go into Sears, you need to talk about what a mouse is. You need to tell them about the difference in monitors, the difference in RAM. What in the world *is* RAM?" he adds.

"In a regular old computer store, the salespeople know what a hard drive is. But when you go into Sears, you need to talk about what a mouse is. You need to tell them about the difference in monitors."



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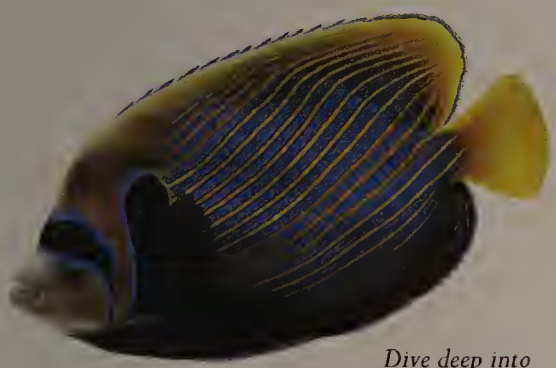

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Tips for Buying in the Mass Market

Buying a computer couldn't be easier. But don't let the convenience lure you into making an impulse purchase. You'll need more than just a credit card to get the right PC.

Here's our advice:

• **Assess your needs.** What will you use the computer for? Will it be an all-purpose machine for home or your primary business computer? The answers to these questions will determine how much PC you need.

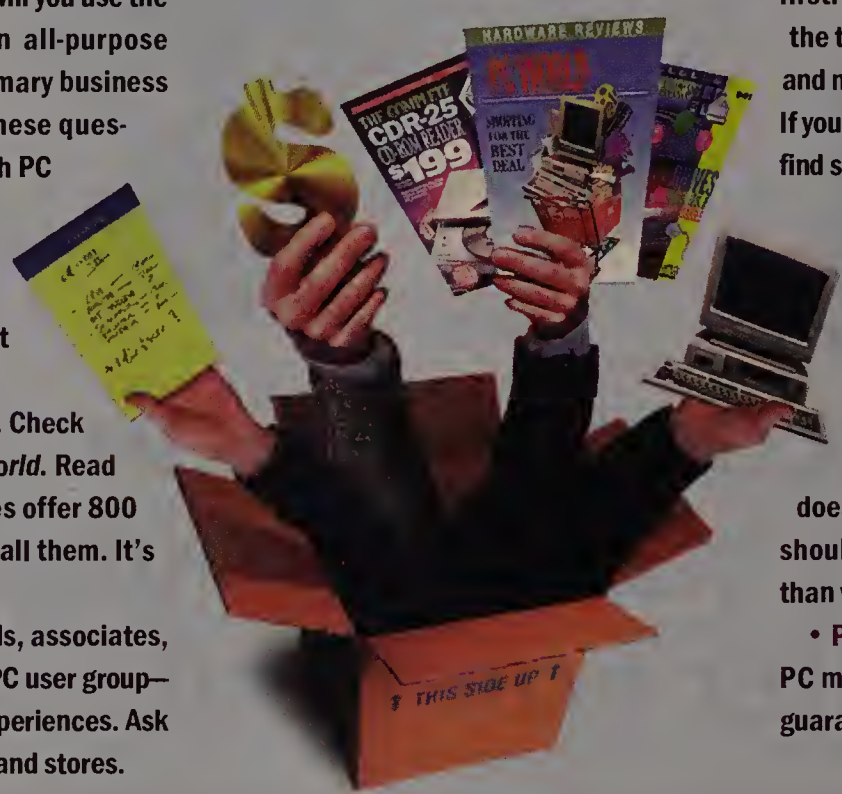
• **Determine your budget.** Know how much you're able to spend *before* you start visiting stores.

• **Bone up on the literature.** Check out the latest reviews in *PC World*. Read the ads, too—many companies offer 800 numbers for buying advice. Call them. It's their dime.

• **Ask around.** Talk to friends, associates, or even members of the local PC user group—anyone who will share their experiences. Ask about specific PC companies and stores.

• **Know your options.** How long is the warranty? What are the tech support hours? How easy is it to add memory, a larger hard disk, or a CD ROM drive?

• **Narrow your choices.** Settle on two or three systems that meet your needs, then start shopping around for the lowest price.



• **Scan your newspaper.** Check ads for computer specials. Warehouse clubs don't advertise, but most other retail players do.

• **Try before you buy.** Don't just load the boxes into your cart. Check out the display first. Do you like the keyboard? What about the tutorial? Does the vendor include disks and manuals with all the preloaded software? If you can't get the display computer to work, find someone who can. If the display literature doesn't answer all your questions, ask the person in the red vest.

• **Unpack the boxes.** Don't wait two weeks before setting up your new computer. Test all the components—modem, fax board, et al.—to make sure everything's okay. If anything doesn't work, call the store right away. You should be able to get a new system, rather than wait for a replacement part.

• **Protect your investment.** Make sure the PC maker *and* the store have money-back guarantees. It's the ultimate protection.

—Roberta Furger and Christina Wood

Hall's training package includes a product demonstration, information about warranty and support services, and pricing details—"everything a salesperson needs to know to sell this product," he says. "Then we take them through a little bit of sales training: Here's the profile of the customer for this product. Depending on different models, particularly on a CPU, we try to help salespeople identify the needs of the customer and try to match them with the units. It's a mistake to sell the wrong piece of equipment to someone. If the customer isn't happy, they're gonna bring it back."

Witness the experience of Packard Bell: "In 1991, Packard Bell took back $107 million worth of product, and 98 percent was not defective. About 68 percent of these machines were returned because the customer wasn't happy, didn't like the way it looked," says Lee Levitt, distribution channels analyst for International Data Corporation in Framingham, Massachusetts.

Packard Bell claims that returns have been reduced but refused to provide numbers to back up the claim. Ransom says that the high return rate is a symptom of the unique arena in which Packard Bell does business.

"You're talking to the only company in the industry that focuses only on retail channels," he says. "If you were able to break out any of our competitors' returns relative to the same channel, the returns would be the same."

Ransom says many returns are based on buyer's remorse, and that less than 2 percent of products returned are defective.

Hit the Books

Despite the potential for buyer's remorse, most of the recent buyers interviewed for this article were satisfied with the computer they chose—a testament, perhaps, to the amount of research they did before buying.

"You need to do your homework no matter where you buy," says Allen Childress, who bought his home computer at Sam's Club in Scottsville, Texas. But research becomes even more critical when you're buying for the first time—and at a self-help–style store.

Childress says mass merchandisers actually make the process easier by *limiting* your selection—a notion that most veterans would find sacrilegious. "The choices aren't infinite, like they are in a computer store," says Childress. "They have about six different computers—from a low-end system up to a 486-66, and prices range from $1000 to $3500. You figure out what you need and what you can afford, and somewhere in between you'll find the perfect computer."

It's not a bad approach for many first-time buyers and more experienced users who like the convenience of shopping at a mass merchant. It's also not unlike the way most consumers buy their home appliances.

Just like buying a TV or VCR, there is nothing like that feeling of picking out your computer, putting it in your cart, and taking it home.

Joe Abernathy is a senior editor at PC World. *Senior Editor Roberta Furger and Assistant Editor Christina Wood contributed to this article. They can be reached on PC World Online (see page 12 for contact information).*

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DOS vs. DOS vs. DOS

There are now three operating systems calling themselves DOS, and each has had a recent upgrade. But which is the best for you?

Life was simpler ten years ago. You bought DOS from the company that made your PC: IBM. Sure, IBM was paying Microsoft for the right to sell that DOS to you, but it wasn't something you had to think about.

Life isn't nearly so simple today. Everybody makes PCs, and three companies sell their versions of DOS. There is MS-DOS 6.2, Microsoft's quick upgrade of the oft-criticized MS-DOS 6.0; PC-DOS 6.1 from IBM; and Novell DOS 7

By Van Wolverton

(an upgrade of Digital Research's DR DOS) from network big shot Novell.

To see how these operating systems measure up, we took a good hard look at all three. Unfortunately, only IBM's PC-DOS 6.1 was available on store shelves when we prepared this article. Our impressions of Microsoft's and Novell's products are based on prerelease code, making it impossible to make definitive judgments about performance or reliability. Look for a sequel to this article when we have shrink-wrap versions of everything.

How should you evaluate these DOSes? Not by cost. Despite a wide range of list prices, all three are expected to sell somewhere in the $50-to-$60 range. There's one exception: If you already have MS-DOS 6.0, you can upgrade with Microsoft's 6.0 to 6.2 StepUp floppy, which will be available in stores for only $9.95 and on bulletin boards and online services—including PC World Online—for the cost of a download.

If you can't shop by price, how do you decide? To hear Microsoft tell it, compatibility with existing applications and past versions of MS-DOS is the *only* issue. But features, utilities, performance, and usability also deserve attention.

The Contestants

Any look at DOS must begin with MS-DOS, the standard. Microsoft released a major upgrade, 6.0, early last year, and quick on its heels came horror stories of lost files, locked systems, and other disasters. Most of these stories involved the disk compression utility DoubleSpace. No matter that it proved well-nigh impossible to re-create the problems, Microsoft had to face the fact it had a public relations crisis on its hands.

Hence version 6.2 of MS-DOS, which Microsoft is touting as safer than 6.0 (without actually admitting 6.0 had problems). The most notable addition is ScanDisk, a disk diagnostic and repair utility similar to those found in Norton Utilities and PC Tools that goes way beyond what the old CHKDSK program could handle. ScanDisk can repair cross-linked files, test the integrity of every sector on your disk, and repair or lock out the bad sectors. According to Microsoft, ScanDisk works equally well on compressed and uncompressed drives. There's also DoubleGuard, which verifies data in memory before writing to disk, and a diagnostic routine in HIMEM.SYS that extensively tests memory when you boot your system. Other changes to MS-DOS include the ability to single-step through AUTOEXEC.BAT and bypass DoubleSpace at start-up. All in all, it's not a major upgrade, but it may help Microsoft restore the faith of scared customers.

IBM and Novell have a more difficult problem to solve: Their products need to

Another View: Tweedledee and TweedleDOS

The closer you look at MS-DOS 6.2, PC-DOS 6.1, and Novell DOS 7, the harder it is to select one. Each has advantages that will attract some users, and shortcomings that will send others scurrying for cover. Like Van Wolverton, I dubbed Novell DOS 7 the best choice for power users willing to put up with (and work around) some minor compatibility problems. But if you're a novice, I'd recommend IBM's PC-DOS 6.1. And if you believe in taking no chances, MS-DOS 6.2 is your best bet.

MS-DOS 6.2 is little more than a public relations upgrade, intended primarily to allay user fears about data integrity. The new DoubleGuard safety features are sure to inspire some confidence, and SmartDrive's new default settings may eliminate some of the data-loss problems that arose when users turned their PCs off too soon. The ScanDisk program, however, doesn't do anything like the extensive testing you get from a professional surface tester like Gibson Research's SpinRite. Overall, these free utilities still aren't the greatest, and you may want to consider some of the better third-party alternatives.

For the most part, though, MS-DOS 6.2 is the same as 6.0. While it makes sense to upgrade to get the handful of new features, there's no urgent need to do so unless you've been experiencing problems. As the de facto standard, Microsoft's MS-DOS is the operating system under which all application software is tested and is therefore, by definition, likely to remain free of compatibility problems. I agree with Van: If compatibility is your first and foremost concern, MS-DOS is your safest choice.

Novell DOS 7, by contrast, has many outstanding capabilities, but it is the DOS most likely to have compatibility problems. Since we haven't yet seen final code, it's impossible to say if Novell DOS will have problems running the variety of DOS and Windows programs out there. Since it doesn't contain the same core code as MS-DOS and PC-DOS, the potential is surely there.

Intentional Flaws

Ironically, many incompatibilities I found in Novell DOS turned out to be intentional. For instance, while MS-DOS's MOVE command can be used to rename a directory, you must use a unique RENDIR command in Novell DOS. (As Van noted, Novell also fails to support Microsoft's multiple configuration scheme and new options in MS-DOS's DIR command.) Novell apparently thinks that since its methods are better, it doesn't need to offer compatibility with Microsoft. That's a risky stance, since some users will always demand 100 percent compatibility at any cost.

Luckily for Novell, its DOS is compelling enough to tempt many users—especially power users—to risk a few minor compatibility problems. Built-in networking, guaranteed NetWare compatibility, a special version of Stacker (which I consider the best disk-compression utility), multitasking that doesn't require the slow, resource-hogging Windows environment, protected-mode TSR support, a protected-mode CD ROM driver, and integrated security are likely to be big draws, especially at large corporate sites. And the online documentation, which includes a pleasant GUI interface, is the first totally complete online manual to ship with any DOS.

IBM PC-DOS 6.1 falls some-

be better than Microsoft's if they expect to gain a serious toehold, since most users will routinely buy MS-DOS without thinking (or get it bundled with their computers). Not surprisingly, the companies have approached this challenge in different ways.

IBM's PC-DOS 6.1 is really MS-DOS 6.0 with some support for pen computing and PCMCIA cards, and a set of third-party utilities that, unlike Microsoft's, aren't crippled or two years out of date. PC-DOS 6.1 was completed before a shared technology agreement between IBM and Microsoft expired in late September, so most of the base code is identical. It looks and feels like MS-DOS, just as all the previous releases of MS-DOS and PC-DOS have been nearly identical. But while MS-DOS comes with watered-down versions of programs like Central Point's AntiVirus and Undelete, and Symantec's Speed Disk, PC-DOS comes with the real McCoys.

Novell, on the other hand, offers major changes at the core. Sure, you'll get the usual collection of utilities that the other two operating systems offer, but how'd you like to have *real* multitasking? And are you considering a network? Here's your chance to get the software for free; just buy some network interface cards and cable, then use the Novell DOS Setup program to get connected. No extra software is needed, even if you want to hook up to a NetWare LAN.

But for IBM and Novell, being better—even much better—isn't good enough. They also must prove they're just as good—in other words, compatible.

Working With Everything

Compatibility comes in several flavors: There's compatibility with the hardware, with the commands that make up the DOSes' minimalist user interface, and, especially important for most users, with the programs—specifically Windows and major applications—that run on top of DOS. This is the hardest type of compatibility to achieve; even Microsoft has to work at it with thousands of beta sites testing each upgrade. If a DOS doesn't achieve absolute compatibility at this level, someday a program will fail, perhaps damaging data.

Unfortunately, we can't use prerelease software to judge software compatibility. Any problems we encounter may be fixed by the time the disks ship, and other incompatibilities may crop up. One statement we can make: Since Novell DOS doesn't use Microsoft's code, it faces the greatest challenge in proving itself compatible.

Then there's hardware compatibility. With 32-bit operating systems such as Windows NT and OS/2, this is a real issue. But with plain old DOS, it's not something to worry about. Everyone manufacturing DOS-compatible computers these days is taking pains to make their hardware fit the standard (the exception is IBM with its Micro Channel machines, and even they vary little in the software). Compatibility with peripheral hardware, such as CD ROM drives and video cards, comes down to compatibility with drivers—in other words, software.

Finally, there's command compatibility. If you're accustomed to using DOS at the prompt or depend on batch files to automate your work, you need a DOS that's compatible with the commands from your last version. That's a pretty simple kind of compatibility to achieve, and one we can judge from our early copies. Basically, incompatibilities at this level are a matter of choice—someone has a better idea of how a command should be used—rather than an error or inability to test all the possible circumstances.

So how command-compatible are the new DOSes? Even Microsoft doesn't get a clean bill of health. In mov-

where between the other two in terms of both features and compatibility. Because it's based on the same code as MS-DOS, it should be compatible with virtually all applications. But it lacks some utilities, such as Qbasic, and MS-DOS's Edit is replaced by IBM's "E" editor, which doesn't offer enough additional features to make the relearning process worthwhile. However, the third-party utilities bundled with PC-DOS are first-rate. They are complete third-party programs rather than the crippled versions that come with MS-DOS.

So why is PC-DOS the best option for novices? Documentation, for one thing. Along with a full set of conventional books, the package has Que's *Everyday DOS*, a good beginner's text that costs $16.95 if bought separately. You can buy MS-DOS 6.2 with special copies of Dan Gookin's *DOS for Dummies*, but you can't get MS-DOS with Gookin's book *and* complete documentation. (In fact, you can't buy MS-DOS with complete documentation.)

What's really amazing is IBM's support policy. Voice support isn't just free, it's toll-free—an incredible bargain in an age when most companies nickel-and-dime you to death when you're ill-prepared to argue. To get support for PC-DOS, you call an 800 number; if a tech can't help you right away, you'll get a call back. This by itself might be a compelling reason to pick PC-DOS. If you call more than twice, you might save more than the cost of the product on support.

Compare that to Microsoft's support policy, which provides users with only 90 days of free technical support. After that, you will have to pay through the nose—calling a $2-a-minute 900 number, charging a $25 per-incident fee to a credit card, or paying $195 annually for a support subscription.

Voice support for Novell DOS is worse. The first 30 days are free, but after that you must call a 900 number ($2.95 for the first minute, plus $1.95 thereafter) or pay a $25 flat fee per incident.

Which product would I choose? As a power user and a subscriber to CompuServe (where it's easy to get 24-hour advice), I'd go for Novell DOS, with its integrated networking, bundled Stacker, and built-in DOS multitasker.

But not everyone matches my profile. If you're a novice or expect your organization to make a large number of support calls, IBM is probably the best bargain. And if you can't risk incompatibilities, choose MS-DOS.

—Brett Glass

But what's really amazing is IBM's support policy. Voice support isn't just free, it's toll-free. This by itself might be a compelling enough reason to pick PC-DOS.

ing from MS-DOS 5.0 to 6.0, Microsoft dropped a dozen or so commands; in version 6.2, for example, Microsoft moved the Shell to the supplemental disk, effectively killing the Shell's opportunity to be a widely used feature. Users who like these abandoned tools must either make sure not to delete them when they upgrade, or order the supplemental disk from Microsoft.

Microsoft claims it dropped the Shell from the 6.2 distribution disks because no one used it, but either Microsoft's research was inadequate, or the company's being somewhat disingenuous. For millions of DOS diehards who hadn't yet embraced Windows, the Shell offered the easiest way to manage files and the *only* way to do task switching. A case can be made that Microsoft is purging as many remnants of IBM's partnership in DOS development as it can: Many of the programs and files dropped from the last two versions of MS-DOS—such as the COMP command, the DOS Shell, and PRINTER.SYS—were written either by or at the behest of IBM.

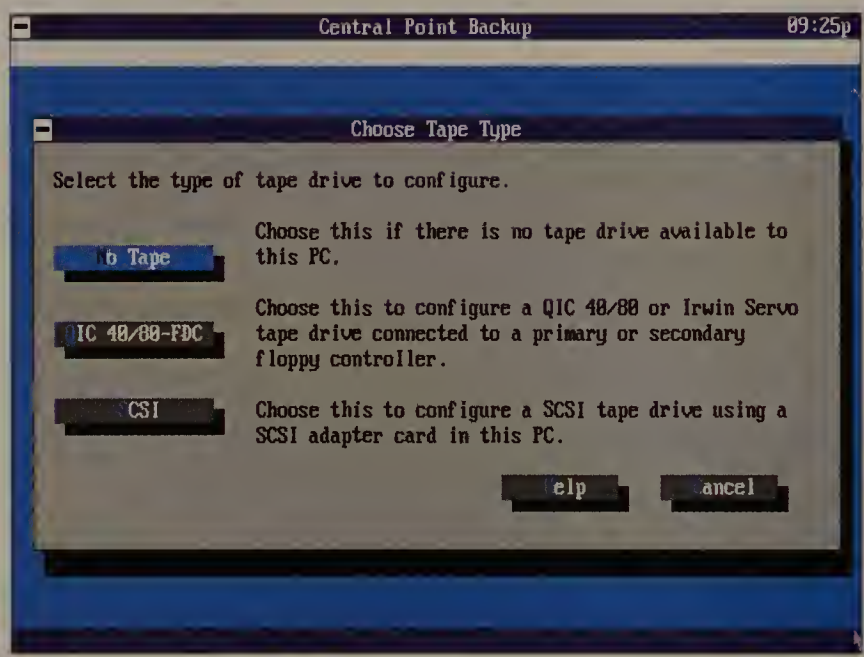
Not surprisingly, all these tools are still in PC-DOS. Because the basic code is essentially the same, PC-DOS is quite compatible with MS-DOS. If you use MS-DOS 5.0 or higher, PC-DOS 6.1 will feel like home.

PC-DOS's disk compression hasn't yet met the test of widespread marketplace use, since IBM just started shipping its bundled version of AddStor's SuperStor in late October. It remains to be seen whether it will face the same sort of negative reception that DoubleSpace encountered. But at the command and program levels, PC-DOS's compression is probably as compatible as you can get.

But IBM's DOS lacks two programs that many MS-DOS users depend on: Edit and Qbasic. PC-DOS 6.1 has its own editor and another language interpreter, but if you're used to Microsoft's tools, you'll be in for some relearning.

Novell DOS 7, on the other hand, goes its own way in a few instances. The DIR command, for example, lacks many MS-DOS 6.0 enhancements, including those that let you list files by attribute, sort your list, and include subdirectories in your search. True, Novell DOS 7 comes with a separate program that offers this same functionality, but using it could involve a change of habit—and of batch files.

As with Microsoft's and IBM's DOSes, Novell DOS 7 lets you set up CONFIG.SYS and AUTOEXEC.BAT files to provide multiple boot configuration options.



IBM HAS THE BEST BACKUP: PC-DOS 6.1's version of Central Point Backup is the most useful backup utility included with a DOS.

Unfortunately, the commands you use to define those options don't match Microsoft's and IBM's. You could argue that Novell's commands are more flexible than Microsoft's—for example, you can paint your own menu instead of accepting the bland default of MS-DOS. But if you're already a DOS 6.0 user, you could go insane rewriting AUTOEXEC.BAT and any other complex batch files you might have. Even if you weren't using MS-DOS 6.0, that incompatibility could mean trouble if you want to share batch files with others. Technically, Novell's method may be superior, but some decisions are better made by marketing than engineering.

Managing Your Memory

None of these operating systems breaks the 640K memory barrier, but at least we're getting closer to opening all 640K to applications. All three include memory management programs that place device drivers and other RAM-resident programs in upper memory (between 640K and 1MB); Novell DOS even allows RAM-resident programs to run in extended memory (above 1MB), where there's much more room to play. The catch is that the programs must be designed to run in extended memory via Novell DOS; for the foreseeable future, the only utilities so designed will be those that come in the box.

All around, the results are impressive. On the same PC, after we loaded the required system elements into conventional memory and all other programs higher, the three DOSes left 622K to 626K of RAM.

But numbers aren't the whole story. MS-DOS and PC-DOS both include an optimizer that determines how to make the best use of your memory; in most cases you need only type a command and wait while your system is restarted a few times. When the activity finishes, you've got new CONFIG.SYS and AUTOEXEC.BAT files that know which programs to load high and in what order. Using Novell DOS 7, you must do the job yourself.

The optimizers can't handle everything, however. I achieved the numbers above, for instance, by manually fiddling with all three DOSes; the optimizers did not give me as much free room as I could achieve on my own. One feature they can't cope with is multiple configuration options; if your CONFIG.SYS brings up a menu of configurations and executes different commands depending on your choice, the optimizers won't automatically give you the best use of memory all around (interestingly, several third-party memory managers have adapted themselves to DOS 6.0 to the point where they can handle multiple configurations). Similarly, if your AUTOEXEC.BAT file calls other batch files that load memory-resident programs—this could be a continuation of the multiple-configuration process—the optimizers won't examine and alter the commands in these, either.

What's more, PC-DOS's optimizer had a few problems. It refused to load the two largest resident programs for our LANtastic network—REDIR.EXE and SERVER.EXE—into upper memory. It wasn't that we couldn't load these programs high with PC-DOS 6.1; we accomplished that just fine, but only after we manually altered CONFIG.SYS.

So there are some situations that the memory optimizers in MS-DOS and PC-

DOS can't handle, but by and large they take the mystery (and tedium) out of making the most of your available memory.

The big noise about MS-DOS 6.0 was the set of utility programs included free, especially file compression (the previous version of Novell DOS, DR DOS 6, already had disk compression, but it took Microsoft's DoubleSpace to make people sit up and take notice). Now all three of the operating systems have the same basic set of utilities: disk compression, backup, undelete, antivirus, and disk defragmenting. To this brew MS-DOS 6.2 adds ScanDisk, its disk diagnostic and repair program.

Most of these utilities are licensed from other developers, principally Central Point Software, Symantec, and Fifth Generation Systems (recently acquired by Symantec).

Central Point Software may benefit from the DOS wars more than anyone. Symantec

Novell DOS on a Network

Of the three new DOSes, only DOS 7, from network market leader Novell, has built-in networking capabilities. This is big news for connected DOS users who hunger for network software that's integrated into the operating system.

And integrated it is. Novell DOS comes with both peer-to-peer and client/server capabilities. You can use it to set up a small departmental LAN, connect to a Novell NetWare server, or do both at the same time on the same machine. And thanks to the network-aware setup program, the challenging job of turning a DOS computer into a NetWare node becomes relatively simple with Novell DOS.

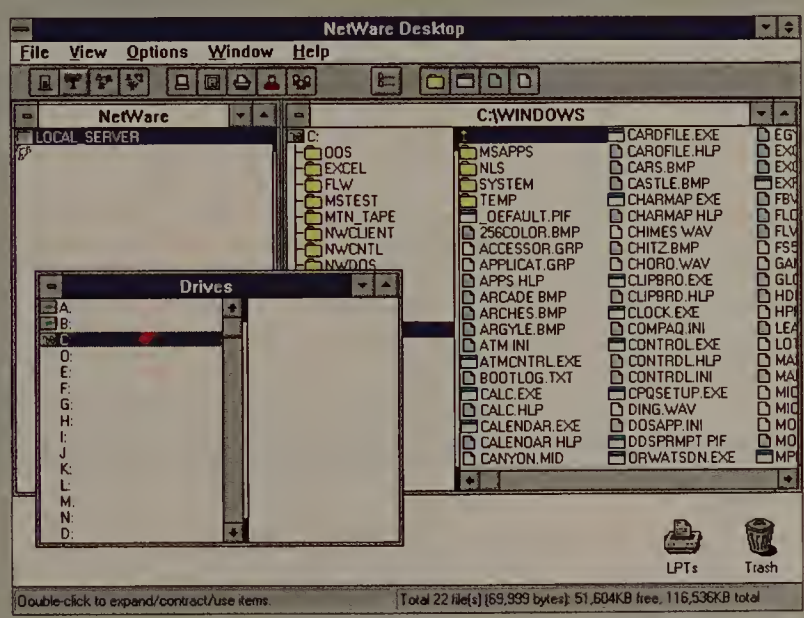
Easy Networking?

But can the average Joe or Josephine set up a network with Novell DOS without going crazy? To find out, I tossed aside the manual and attempted to configure a six-station Novell DOS LAN without resorting to the documentation. To my delight, I discovered I could install the network through Novell DOS's main setup menu, and that the process was quick and amazingly trouble-free. I did my experiments with a prerelease copy of Novell DOS; the shipping product may differ.

When you set up a network, the only information you need to provide is the model, I/O address, and the interrupt level of each machine's network interface card. The default settings for the major adapters are built Into Novell DOS's installation program, so if you haven't fiddled with your board's jumpers, you should have no trouble. In contrast, Microsoft's Windows for Workgroups, which includes a peer-to-peer network, automatically tries to determine the identity and settings of your network adapter. This is convenient, but risky; Novell's more conservative approach is less likely to cause crashes or interfere with other peripherals.

As soon as I entered this information, the network drivers installed themselves with no further action on my part. Everything ran perfectly on an assortment of Artisoft AE-2 and AE-3 cards (which are enhanced Novell NE2000 clones) and Earth Computer Technology Earthnet 1E cards (inexpensive NE1000 clones). While I did no formal benchmarking, peer-to-peer performance seemed similar to that of LANtastic running on the same machines. And I had no trouble using a workstation to log onto a NetWare 3.11 server.

Novell DOS uses its advanced memory management capabilities to keep the network out of your way. Thanks to Novell's DOS Protected Mode Services (DPMS) feature, the peer-to-peer server software needn't reside in either conventional or upper memory, which are often crowded with programs trying to stay out of conventional memory, but in extended RAM, where there's bound to be plenty of room. And a number of the other network TSRs that come with Novell DOS are Virtual Load Modules (VLMs), which the operating system can swap in and out of conventional memory as they're needed.



EASY NETWORKING IN WINDOWS: Novell DOS 7 includes Windows tools that let you administer your LAN and establish access to network resources by pointing, clicking, dragging, and dropping.

All Novell DOS's networking features will also be available as a single separate product, called Personal NetWare, which eventually will replace the current NetWare Lite. Interestingly, both Personal NetWare and Novell DOS 7 list for $99.

To accommodate both large and small organizations, Novell DOS comes with everything you need for peer-to-peer networking among DOS machines, connecting to a NetWare server as a client, or doing both at the same time. Among these tools are the Personal NetWare Desktop, a Windows-based configuration and administration utility whose intuitive drag-and-drop interface and extensive online help make routine network tasks a breeze. There's also an equivalent DOS-based utility and DOS- and Windows-based diagnostic programs. While I didn't perform extensive tests on all the network management features, I noted that Novell DOS included agents for the Simple Network Management Protocol (SNMP). This standard lets you manage your peer-to-peer network locally or remotely with nearly any network management software package. One glaring omission: an E-mail program. But any NetWare-compatible E-mail program should be able to work with Novell DOS.

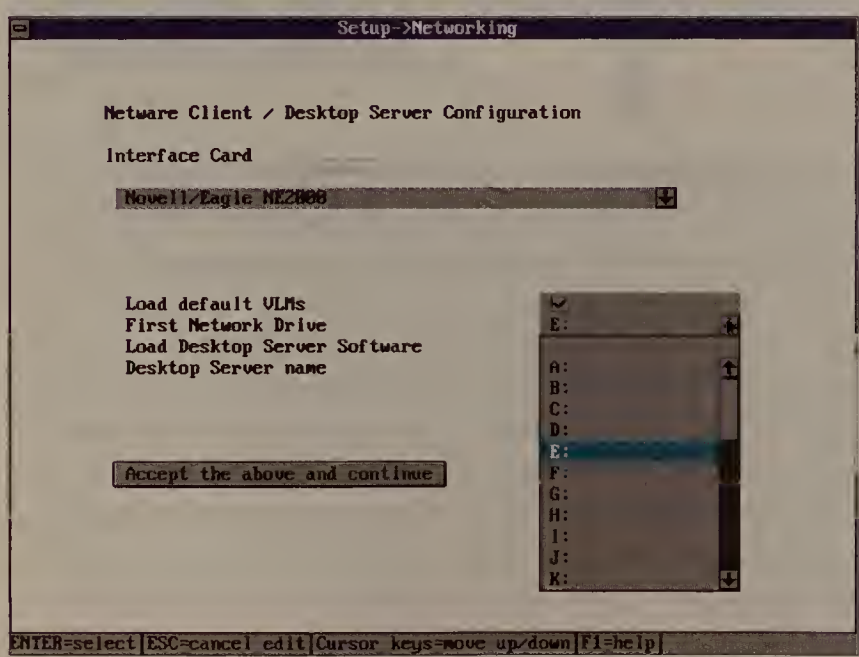
—B.G.

managed to sell its disk defragmenter to both IBM and Microsoft, but Central Point is represented by two utilities in MS-DOS 6.2 (Undelete and AntiVirus) and three in PC-DOS 6.1 (RAMBoost, Central Point Backup, and Undelete). Novell went to Fifth Generation Systems to get Fastback Express for its backup and antivirus utilities. None of these third-party companies is giving away the store; the software they licensed to Microsoft is either incomplete or out of date. IBM paid to get newer and more complete versions, but even its utilities are in many cases one level behind current versions on the market.

All the disk compression utilities use similar technology to compress and expand files as the operating system needs them. All three offer about the same performance, too, taking about the same amount of time to set up a compressed disk, achieving about the same compression ratio, and exacting the same performance penalty (negligible, in most cases). None of the programs came close to a 2-to-1 compression ratio, the figure most commonly used in promotional literature. None of the systems was noticeably faster than the others at compressing, although the entire process in MS-DOS 6.2 takes longer because of ScanDisk's more thorough check. For more information on disk compression, see "Is Compression Worth It?" in this issue.

It's worth noting that both Novell and IBM come with versions of established third-party compression programs, although Microsoft's product, DoubleSpace, quickly became the market leader when it was released with DOS 6.0. PC-DOS comes with AddStor's SuperStor, while Novell DOS has Stac Electronics' Stacker. These programs offer one major advantage over MS-DOS's DoubleSpace: They're more portable. They let you compress a floppy, copy a couple of megabytes of files onto it, and then read that floppy on a PC that does not have compression software.

The backup utilities are also similar. You start the program, it checks your system to see what sort of devices are attached, then runs through a trial backup to confirm how fast it can write to your backup drive. MS-DOS 6.2 and Novell DOS 7 let you back up only to a floppy disk or other device identified by a drive letter, such as a removable hard disk. PC-DOS 6.1, however, makes this task truly convenient by letting you back up to a tape drive, the preferred backup medium.

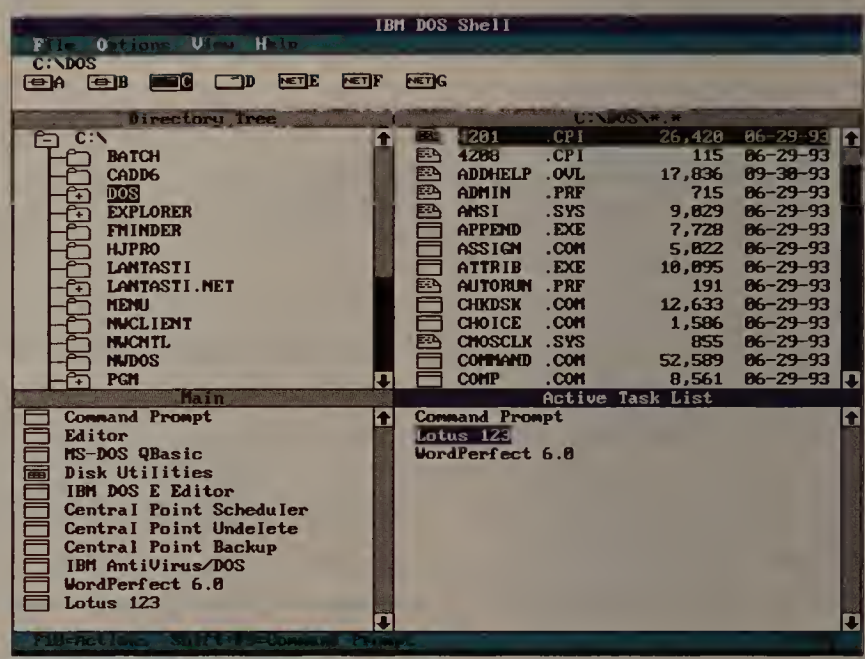


EASY CONNECTIONS: Novell DOS 7 includes peer-to-peer networking, a feature not available in either MS-DOS 6.2 or PC-DOS 6.1.

You undelete files much the same way with all three systems. Files can be recovered quickly if you have not written other files to the disk. The antivirus programs scan your files and build a database for comparison; after a first run that takes 10 to 15 minutes, subsequent checks take a minute or so. MS-DOS and PC-DOS use the same disk defragmenter from Symantec, but the MS-DOS version is limited to drivers no larger than about 250MB; Novell developed its own optimizer.

Doing Two Things At Once

Both IBM and Novell offer task switching, which allows you to keep more than one program up at a time. MS-DOS previously had this capability, but Microsoft's version 6.2 lacks the DOS Shell, where the feature resides. If you want task switching with MS-DOS 6.2, you'll have to either hang on to the DOS Shell files when you upgrade from version 6.0 or order the supplemental floppy disk.



THE DOS SHELL, with its quick and simple file management and task switching, still lives in PC-DOS 6.1.

But task switching is a limited affair; programs in the background remain dormant until they're called to the front. Novell DOS 7 has gone beyond that to offer full multitasking, which allows programs in the background to continue to run on 386-compatible systems. This means, for instance, that you can start a print job in your word processor, then move over to your spreadsheet for some other task while you continue to print in the background. Microsoft critics have long complained about the lack of multitasking in MS-DOS (and, by implication, in PC-DOS). But then, Microsoft and IBM might prefer that you buy Windows or OS/2 for your multitasking needs.

The other Novell exclusive is networking. Novell DOS 7 includes its own peer-to-peer network software, allowing you to create a small network without additional software. And just as Microsoft can virtually guarantee compatibility with Windows, Novell can feel confident its DOS will provide seamless connectivity with its own NetWare network operating system—as much an industry standard as anything is. Of course, just as all three DOSes can run Windows, they all work fine with NetWare. But Novell DOS gives you the comfort of dealing with a single vendor for your entire

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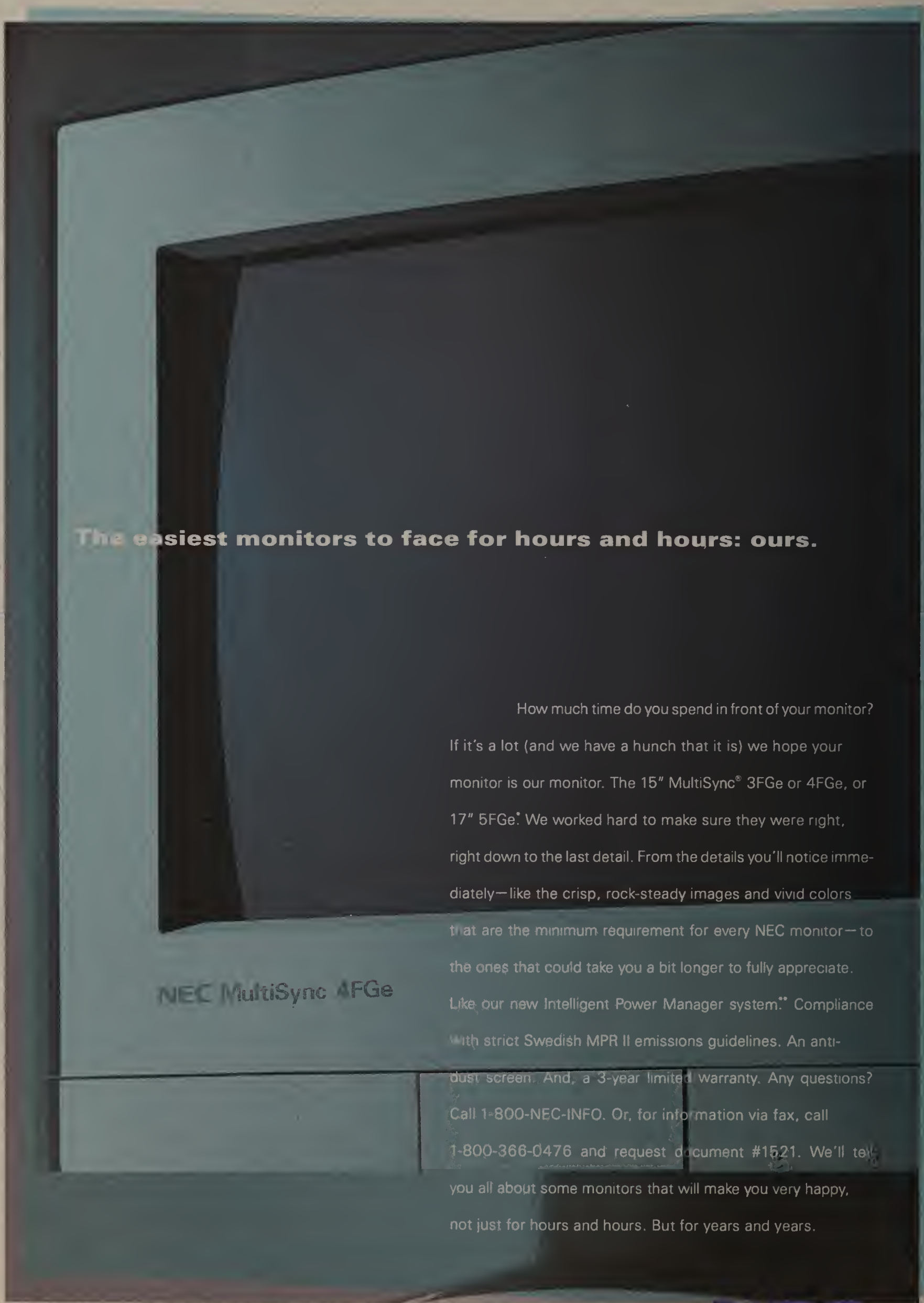

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network. For more details, see the sidebar "Novell DOS on a Network."

Read the Documentation

All programs are easy to use if you know how to use them. It's when you don't that you need the documentation.

IBM wins the printed documentation competition hands down. PC-DOS comes with four manuals: a 430-page user's guide, a 396-page command reference and error message book, a 130-page tutorial published by Que books, and a 40-page installation guide. Novell DOS includes a 432-page user's guide but lacks a tutorial or command reference (although the online help includes the latter). Microsoft offers two similarly priced ways to buy MS-DOS 6.2, each with different documentation. You can buy the standard upgrade (not to be confused with the 6.0 to 6.2 StepUp), which comes only with the inadequate, and now dated, 354-page book that accompanied version 6.0. Or you can buy a special version of Dan Gookin's book *DOS for Dummies* (IDG Press) with upgrade disks.

Online documentation is another matter. Novell DOS leads the pack with a near-clone of the printed manual, plus the aforementioned command reference. It's exhaustive and relatively easy to search; chances are you won't really need the printed manual. MS-DOS 6.2's expanded help feature, added in 6.0, isn't bad. PC-DOS, however, lacks even that, offering just a screenful of syntax when you type a command and /?

Getting Them Going

All three systems have easy-to-use installation programs. You put the first floppy disk in drive A:, type a command, choose the features you want to install, and wait while the installation program copies files to your hard disk and then prompts you to put in the next floppy.

Because PC-DOS and MS-DOS share so much code, installing one is pretty much the same as installing the other. Novell's installation program, however, has a different feel that's only partially due to its more graphical, mouse-driven interface. Novell DOS offers many more choices, some of which require a pretty good understanding of how DOS works. Basically, if you're not a power user, get someone who is to help you install it. And if you have anything out of the ordinary in your AUTOEXEC.BAT or CONFIG.SYS, make backup copies of those files, then delete (or REM out) all the commands that depart from a plain vanilla system before you start the installation.

Novell's installation does have one nice touch: You can use the same menu and mouse interface to fiddle with your configuration *after* you've installed the operating system. This makes it easy (well, easier, at any rate) to juggle memory management parameters, set up multitasking, and set other features that would otherwise require fussing directly with CONFIG.SYS and AUTOEXEC.BAT. It may not handle all of the changes that you want to make, but it does take care of the most common ones.

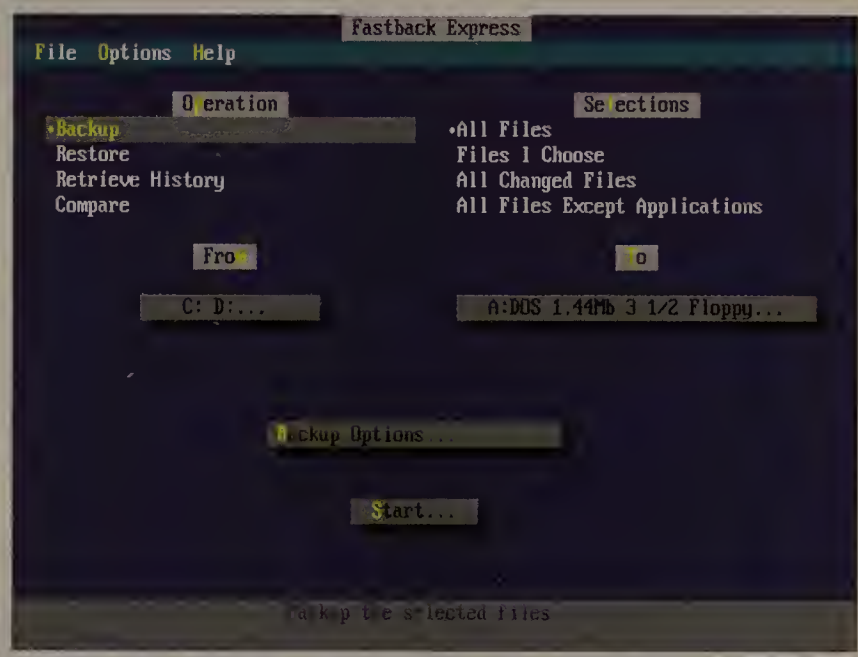
Once installed, the three systems vary in how much disk space they require—the added utilities aren't exactly free. Installing all of MS-DOS 6.2's options—including both the DOS and Windows versions of the backup, antivirus, and undelete programs—will put 7MB of files onto your hard disk. PC-DOS 6.1 with the same choices weighs in with 10MB of files. But it's Novell that takes the biggest bite: Installing everything, including the peer-to-peer networking option, puts 336 files—nearly 12MB of data—into eight different directories; omit the network, and you'll get 7.2MB in four directories.

All three DOSes come with an uninstall option that can return you to your prior operating system. If you discover a serious incompatibility after upgrading your system, it's nice to know you can easily go back to your old way of doing things.

So Who Wins?

Is there an obvious winner? MS-DOS has ScanDisk, more safety features for DoubleSpace, CD ROM caching, commas in big numbers, simple batch file debugging, safer MOVE/COPY/XCOPY commands, and some lesser bells and whistles. But what MS-DOS really has is the installed base; everyone has MS-DOS, and almost every PC comes with it. Microsoft controls Windows too, so the company defines what its competition has to be compatible with.

MS-DOS has, in fact, become the safe choice. It's not necessarily the leading-edge choice, or the risk-taker's choice, or the technology wonk's choice, but the choice you make when even a minuscule chance of downtime or lost data spells disaster. Like thirtysomethings who shriek in horror when they realize they're turning into their parents, some folks at Microsoft must be appalled to discover they've become IBM.



EASY BUT LIMITED BACKUPS: Novell DOS 7 comes with Fastback Express, a backup utility from the now defunct Fifth Generation Systems. The user interface is nice, but it can't back up to tape drives.

And today, no one is getting fired for recommending that the company buy Microsoft.

PC-DOS offers pen and PCMCIA support, portable compressed floppies, and more complete utilities. Even with the added benefit of nearly unquestioned compatibility with MS-DOS, though, PC-DOS 6.1 isn't attracting much attention. Its major market—almost its only market—continues to be the IBM installed base.

For that matter, PC-DOS can't even claim all the new IBM machines. It's amusing that IBM's Ambra and PS/1 machines come with MS-DOS and Windows. Imagine that happening a few years ago.

Novell DOS 7 brings the biggest platter of goodies to the feast, but it's difficult to visualize many people coming to the table. DR DOS built a small, fanatically loyal following, especially as it continued to beat MS-DOS to the punch with new features. But most of those customers were pretty sophisticated users, eager to stay out on the

leading edge of the curve and willing to deal with the risks out there. That's a noisy market; it's not a mass market.

Novell's networking and multitasking make this operating system a tempting choice, but its compatibility and reliability have yet to face the rigors of tens of millions of users and the myriad hardware and software environments they represent. If Novell DOS passes the compatibility test, many users—especially NetWare clients—will be tempted to make the move. That represents a lot of machines, and Novell can present a compelling case for complete integration of network and operating system technology and support. But the very size of these installations makes them the most vulnerable to operating system problems.

If your office is running NetWare, you may want to give Novell DOS a try—at least on a nonproduction system. But you probably shouldn't risk your operation on it—at least, not yet.

If you're addicted to technology, you'll probably find Novell DOS irresistible. Technophiles have traditionally been DR DOS's major market, and although this group is small, it's vocal and influential.

If you need more safety than Novell can yet guarantee, but you're looking for some utility bargains with your operating system, get IBM's PC-DOS. It has the same core as Microsoft's with a better set of add-ins.

But if you're like most people, you'll probably want to follow Microsoft's siren song of safety. There's simply no risk involved. And chances are that MS-DOS 6.2 will be the operating system on any new computers you buy this year, since PC manufacturers will be hesitant to jump ship. Competition is brutal, and none of them wants to be the first to offer something that might worry its customers. Innovation is a tough sell in a commodity market.

Life really was simpler ten years ago, but not nearly as interesting.

Van Wolverton is the author of nine computer books, including Van Wolverton's Guide to DOS 6 *(Random House Electronic Publishing, New York, 1992) and* Van Wolverton's Guide to OS/2 2.0 *(Random House Electronic Publishing, New York, 1993). Brett Glass is a contributing editor for* PC World. *He can be reached on PC World Online (see page 12 for contact information).*

WHERE TO BUY

IBM PC-DOS 6.1
List price: $189 for base product, $109 for upgrade (must already have DOS installed)
IBM
800/772-2227

MS-DOS 6.2
List price: $77.95 (upgrade only, must already have DOS installed); MS-DOS 6.0 to 6.2 StepUp $9.95 (must already have DOS 6.0 installed)
Microsoft Corp., 800/426-9400
Reader service no. 697

MS-DOS 6.2 Upgrade for Dummies, Special Edition
Estimated list price: $77.95
IDG Books
800/762-2974
Reader service no. 701

Novell DOS 7
List price: $99
Novell
800/453-1267, 801/429-7000
Reader service no. 702

FEATURES COMPARISON

What You Get With the DOSes

In the feature race, IBM and Novell have to beat Microsoft just to stay in the game.

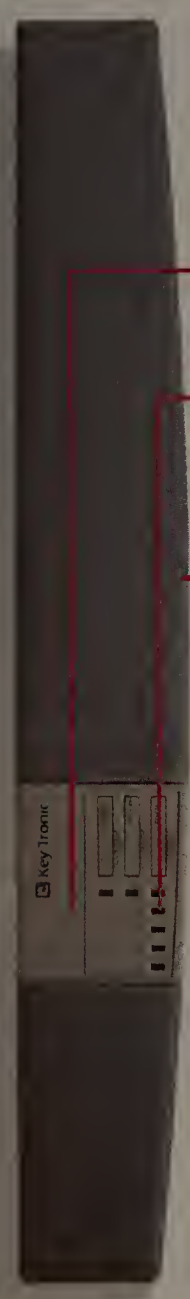
● Yes
○ No

Standard features	IBM PC-DOS 6.1	MS-DOS 6.2	Novell DOS 7
List price	$109/$189[1]	$77.95	$99
Minimum disk space required[2]	5.2	5.2	5.3
Maximum disk space required	10.0	7.0	11.6
Maximum available conventional memory (K)	620	622	626
Memory management	●	●	●
Memory optimizer	●	●	○
Reconfiguration program	○	○[3]	●
Task switching	●	○	●
Multitasking	○	○	●
Networking	○	○[3]	●
Shell	●	○	○
File compression			
Disk diagnosis and repair	●[4]	●	●[4]
Disk optimizer (defragger)	●	●	●
Automatic mount of compressed volume	●	●	●

Standard features cont'd	IBM PC-DOS 6.1	MS-DOS 6.2	Novell DOS 7
Compressed floppy usable anywhere	●	○	●
Automatic uninstall	●	●	●
Backup	●	●[5]	●[5]
Undelete	●	●	●
Antivirus	●	●	●
Disk defragmenter	●	●	●
Multiple configurations	●	●	●[6]
Printed documentation (manuals)	●	●[7]	●
Online documentation (help)	●	●	●

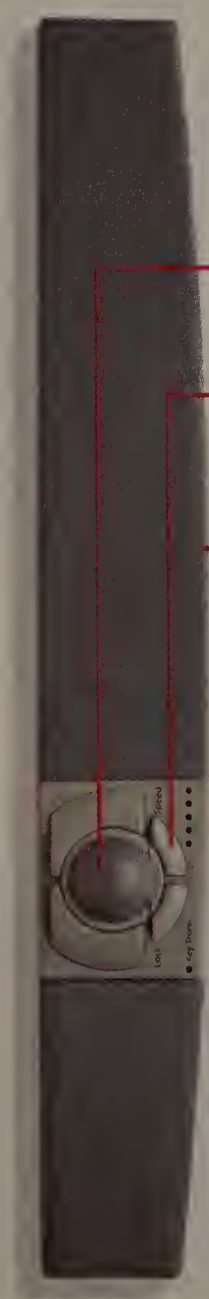
[1] Upgrade, which requires an existing version of DOS, costs $109; full version costs $189.
[2] Includes basic utility set: file compression, backup, antivirus, and defragger.
[3] Requires DOS Shell files either on supplemental disk or left over from DOS 6.0.
[4] Minimal, command-line CHKDSK program.
[5] Neither MS-DOS 6.2 nor Novell DOS 7 will back up to a tape drive, the most popular backup medium.
[6] Not compatible with MS-DOS 6.2 or PC-DOS 6.1.
[7] Documentation not updated since version 6.0.

Wrist Management.



The PACEMATE™ Features:

- *Built-in work pace module that monitors keyboard activity*
- *Visual and audible indicators allow user to manage work pace by integrating short breaks*
- *Height adjustable wrist pads for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*



The TRAKMATE™ Features:

- *Trackball integrated into the wrist pad's design*
- *Two extra buttons with corresponding LEDs for trackball speed control and drag lock*
- *Height adjustable wrist pad for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*

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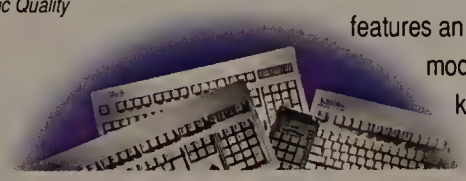

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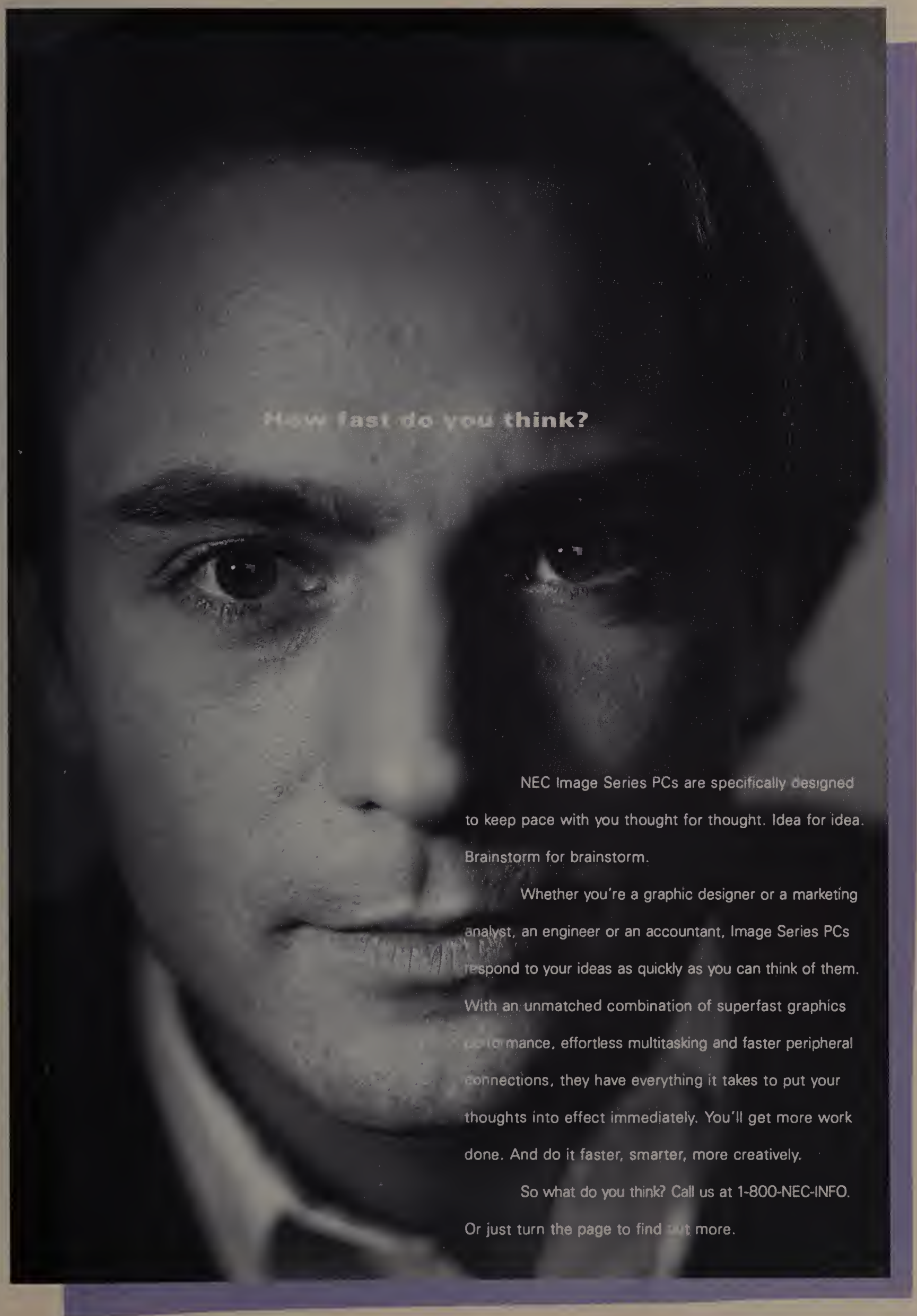
Circle 223 on reader service card

How fast is an Image™ Series PC?
NEC Image 466es



Circle 203 on reader service card

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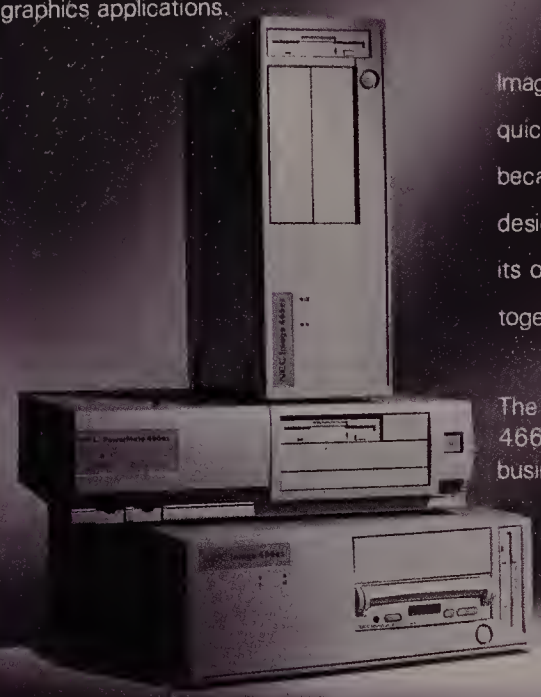

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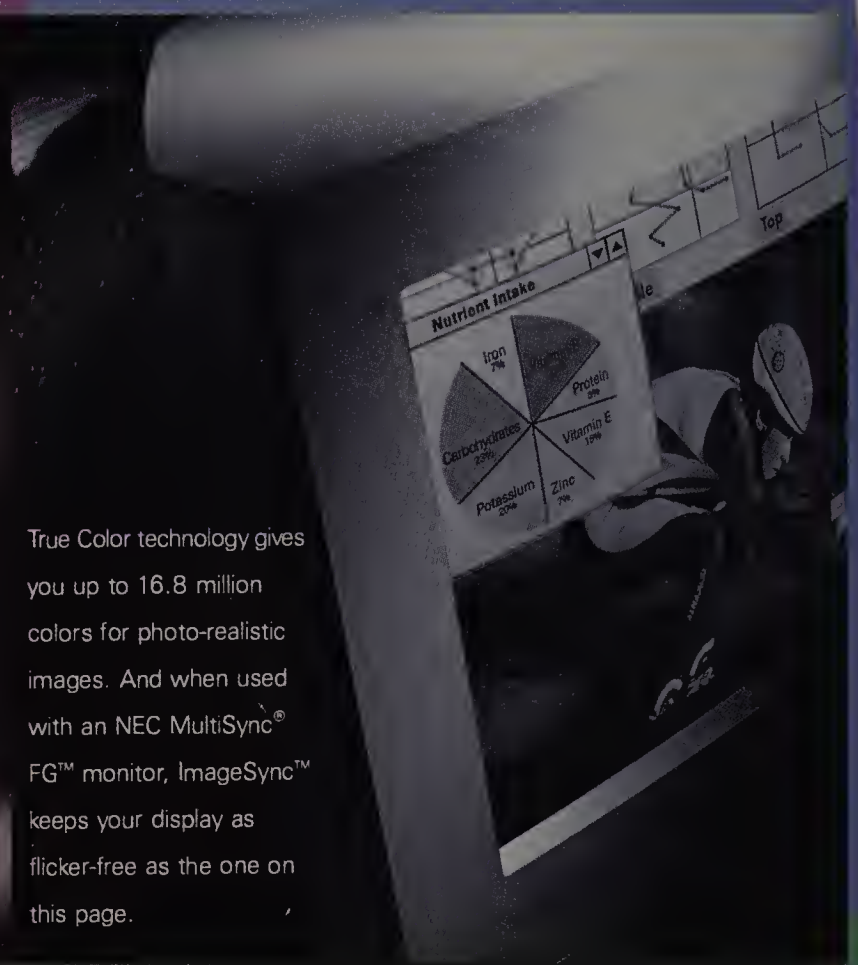

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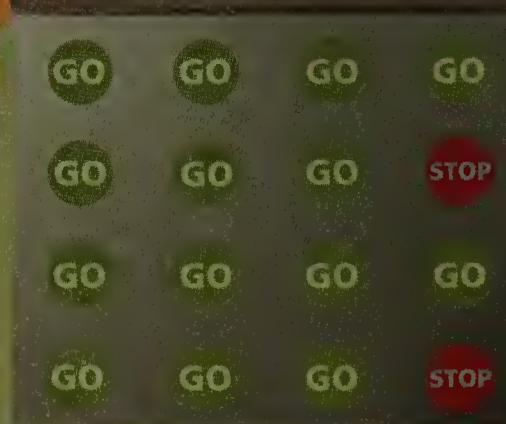

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Is Compression Worth It?

BY BRETT GLASS

It's a fundamental law of nature: No matter how much hard disk space you have, it's never enough. Programs are getting fatter and demanding more storage, especially Windows programs. So unless you've recently bought a system with a hard disk that—at least for the moment—still seems large enough, you probably need some way to increase capacity.

DOS 6, Stacker, and other programs increase your disk size with on-the-fly compression. But is the added capacity worth the risks?

You could, of course, buy a larger hard disk, but that can be an expensive and complicated proposition. As a result, many users are turning to on-the-fly disk compression programs such as Stacker or DOS 6.*x*'s DoubleSpace to effectively double the size of their hard disks. But are these programs a good solution to your storage woes? Some experts say that the gains are never as good as advertised, that on-the-fly compression slows down your computer, and that the whole idea is inherently unsafe. Are they right? We examined all these issues and came away convinced that compression is worthwhile—with some reservations.

For this article, we examined the two most popular products: DoubleSpace, included in every copy of MS-DOS 6.*x*, and Stac Electronics' Stacker 3.1, the best-selling disk compressor that you can buy without an operating system. There are other compression programs out there, including AddStor's SuperStor and

LUIS DELGADO

IIT's XtraDrive, but we decided to stay with the market leaders.

Disk compression utilities work in the background, intercepting all instructions to read from and write to the hard disk. What other programs see as a hard drive is actually a large hidden file. When you write to disk, the compression program shrinks your data and stores the slimmed-down version into this virtual drive; when you retrieve the file, the utility restores it to its original form. In theory, your other programs never know these changes are happening.

The Compression Bargain

Disk compression has one obvious virtue: it's inexpensive, and it costs the same whether you're compressing a 40MB or 2GB drive. The MS-DOS 6.*x* upgrade package, which includes a full operating system and a large set of utilities in addition to DoubleSpace, lists for $129.95 and costs about half that on the street. Stacker 3.1 has a list price of $149 and generally sells for $65 to $70. While Stacker is *only* a compression program, it has several features that make it more convenient than DoubleSpace. For instance, you can make compressed floppies that systems without Stacker can read.

If you pay $75 for compression software and with it can store 80 percent more data on your 100MB hard disk, you'll be paying less than $1 per megabyte (a good price for a hard disk). If your disk is bigger, you'll save even more.

How Much Space Do You Gain?

The first issue to consider is how much additional disk space compression offers. The answer is that there's no easy answer. Compression programs work by removing redundant data, and there's no way to predict how much redundancy a given file will have.

Certain kinds of files compress better than others. Check out "Test Report: How Much Space Do You Gain?" to see what we saved on a typical Windows PC. The most dramatic savings are in small files such as PIFs and BATs; not that those files are compressed more than others, but compression programs improve on DOS' wasteful way of storing small files. (On an uncompressed 150MB drive, a 1-byte file uses 4K of disk space).

But Windows users really need help with big files. Luckily, many of the major disk-wasting file types associated with Windows—such as BMPs, HLPs, and WAVs—get reduced substantially. But ZIP files, which are already compressed, don't get smaller. The final result for our "typical" PC: Compression ratios range from 1.6 to 1, to 1.8 to 1, and offer 60 to 80 percent more room on the hard drive.

How well a compression program does on any mix of files is impossible to predict, and that brings up another problem: The compression program can only guess how much free space you have on your compressed drive. If Stacker or DoubleSpace says you have 10MB free, don't try putting 8MB of ZIP files there.

One DoubleSpace utility, Vertisoft's SpaceManager, can improve DoubleSpace's compression until it approximates Stacker's. This add-in program can also regularly monitor your compression ratio to give you more accurate estimates of your drive's usable free space.

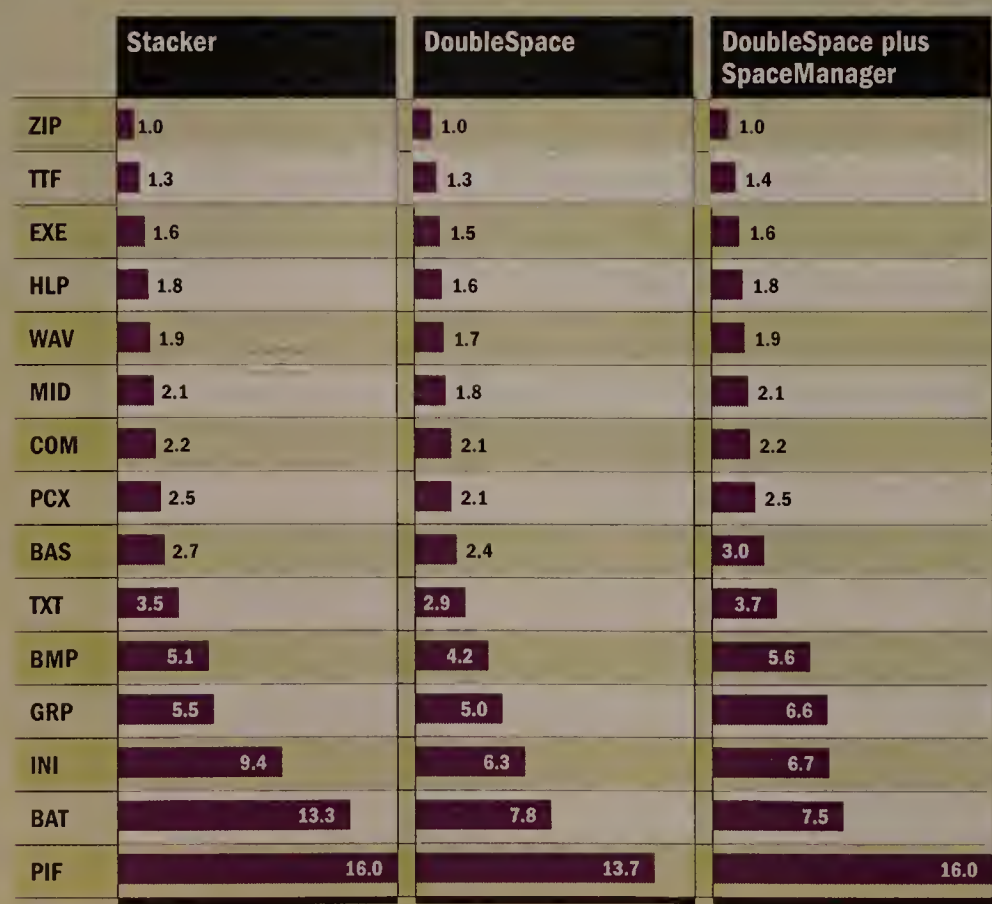
What's the Performance Penalty?

Constantly compressing and decompressing data is yet another burden on your computer's CPU, which can slow down your system. On the other hand, compression reduces the amount of information that must be read from the disk surface, which can speed up your system. To find out if the good effects outweigh the bad, we ran the PC World Test Center's Windows benchmark suite on a 386-33 machine with Stacker and DoubleSpace. See "Test Report: How Much Speed Do You Lose?" for details. Keep in mind, however, that your platform can also make a

PC WORLD TEST CENTER REPORT

How Much Space Do You Gain?

Stacker and DoubleSpace compress certain types of files better than others and store small BAT and PIF files much more efficiently than DOS.



Methodology

We compressed the contents of a 105MB Quantum ProDrive with about 80MB of program and data files on it. The ratios for Stacker were reported by a utility included with the program. The DoubleSpace ratios were both reported by SpaceManager, a separately sold utility that we later used to further compress the DoubleSpace drive.

Compression programs save disk space in two ways, and the ratios displayed here reflect both of them. In addition to actually compressing files, compression programs do not waste as much "slack" space between files as uncompressed DOS does. For that reason, small files show an unusually high compression ratio.

All figures show compression as a ratio to 1. For instance, if a 10K file is compressed to 5K, it's reported as 2.0, meaning that there was a 2.0-to-1 compression ratio. All ratios are averaged to a single decimal point.

difference. The faster your processor and the slower your hard disk, the more likely it is that compression will improve performance.

In all our tests, the uncompressed drive performed faster than the compressed one, although in most cases the difference was slight. The exception was our Paradox test, which slowed by factors of up to 50 percent when we used compression. Why? Databases are disk intensive and are therefore affected by anything that slows disk access. What's more, running a large DOS database under Windows is a lot to ask of a 386 with only 4MB of RAM. The added work of compressing and decompressing data may have been just too much for the computer to handle easily.

If compression slows your system as it did ours, is the performance hit worth it? The answer to that question depends on the hardware and software you're running and the amount of degradation you're willing to tolerate. "The first thing I'd do with any laptop is DoubleSpace it," says Desaware's Daniel Appleman. He's not alone; many users agree that compression is essential on laptops, no matter what the performance cost.

One resource that's even more precious than hard disk space is conventional memory—the first 640K of RAM. A compression program can use up as much as 56K of that. Fortunately, memory managers usually save the day by loading your compression program and other resident software into upper memory. If you're using DoubleSpace, you've already got DOS 6.*x*, which comes with a decent memory manager and a program, MEMMAKER, that will help you load these programs out of the way into upper memory blocks. If you find that MEMMAKER is inadequate, however, you may want to invest in a first-class memory manager such as Quarterdeck's QEMM386, Qualitas' 386Max, or Helix's Netroom.

PC WORLD TEST CENTER REPORT

How Much Speed Do You Lose?

Stacker and DoubleSpace slowed all the applications we tested, especially the disk-intensive Paradox test.

	Word for Windows 2.0	Excel 4.0	Paradox 3.5	Freelance for Windows 1.0
No Compression	4:45	4:14	5:13	4:45
Stacker	5:05 7% penalty	4:23 4% penalty	7:27 43% penalty	4:48 1% penalty
DoubleSpace	5:05 7% penalty	4:25 4% penalty	7:50 50% penalty	4:49 1% penalty

Methodology
Compression options are arranged in order of overall speed, from fastest at top to slowest at bottom. Test results are in minutes:seconds, with the percentage increase from an uncompressed time displayed under the times. (Lower is better in all situations). All tests were run on a 386-33 system with 4MB of system RAM. We used DOS 6.0 running the SmartDrive 4.0 read and write disk cache (1MB cache). We configured Windows on all systems with a Hewlett-Packard LaserJet III as the default printer driver, disabled the Print Manager, and routed the printer output to DOS's NUL: device. The system used the default VGA video driver that came with Windows. Finally, we loaded the test applications, test files, scripts, and Microsoft Test (automation software).

Word for Windows 2.0
We spell-check and scroll through a 27-page document; create, format, print, and save a single-page business letter; open a business proposal document, add a paragraph, then preview and print it.

Excel 4.0
We perform several data extracts; build and format a financial statement from scratch, then print it; open a mortgage analysis, then scroll, move blocks, change the interest rate, print preview the statement, and save it.

Paradox 3.5
Running the program in a DOS window, we perform a variety of data entry, record searching, and updating tasks. Then we generate reports against a simple customer list.

Freelance for Windows 1.0
We load a single-page starter file (built from a standard template included with Freelance) containing a U.S. map with each state as a separate object. Then we enter preformatted text on the page in preset headings, add a second page, and enter text as bullet items. We add three more pages—each containing a single 3-D bar chart—and import data from a 1-2-3 WK1 file. Next we add a sixth page containing four 3-D pie charts and preview a slide show using a vertical-louver fade effect between slides. We apply various views to the presentation and preview the slides four more times, applying a different fade effect between slides each time. Finally, we save the presentation to disk.

Data based on tests designed and conducted by the PC World Test Center. Testing performed by Brett Glass. All rights reserved.

Will It Corrupt My Data?

A lot of users eschew compression because they worry about losing data, and there is some validity to that concern. Because your files are in a compressed form, you can't get to them without the compression program or another utility that supports the compression program; that's one more thing to deal with in an emergency. What's more, in order to restore a byte of data to its original form, the compression program needs to know—with 100 percent accuracy—the values of all the bytes that came before it in the same sector. So, while one corrupted byte of data on an uncompressed drive doesn't affect any of the bytes around it, one wrong byte on a compressed drive can render up to 8K of compressed data irretrievable.

With the release last year of DOS 6.0 and DoubleSpace, reports of compression catastrophes skyrocketed. While Microsoft blames these problems on user error or faulty hardware, it appears—from messages posted on CompuServe and tests conducted by *PC World*'s sister publication *InfoWorld*—that some machines that run perfectly well under normal conditions lose data when used with DOS 6.0 and DoubleSpace.

No one has isolated the source of these problems, or at least no one is admitting it. Some CompuServe users speculate that DoubleSpace overstresses hard drives, thereby overtaxing hardware that's already in danger of failing. From a technological standpoint, however, this argument doesn't hold water: A compressed disk actually moves its heads less and reads and writes less data than an uncompressed disk.

Other sources have blamed Microsoft's SmartDrive disk cache. The version of SmartDrive that shipped with DOS 6.0 returns users to the DOS prompt before writing all the data to disk. That could lead to a corrupted hard disk if you turn your system off too soon. But this doesn't explain all the problems, because some users never turn their systems off and still experience data corruption. DOS 6.2, which should be available by the time you read this, promises to fix several problems with both DoubleSpace and SmartDrive.

Nevertheless, many users remain cautious. Mike Edgerton,

owner of Central Jersey Warehousing in Avenel, New Jersey, maintains a 7-node LANtastic network. Edgerton uses compression on his personal laptop, but says, "I'm not comfortable enough with any disk compression yet to use it on my network."

Not everyone agrees that compression is dangerous. Harry Sutton, a project manager for PRC, a defense contractor in McLean, Virginia, is in charge of a submarine communications test and evaluation project. DoubleSpace, he says, "has been rock solid for me and those in my office who use it." Sutton, a strong advocate of disk compression in general and DoubleSpace in particular, says the reported data loss is due to user error or PC problems that are unrelated to DoubleSpace.

Helen Fiorentini, an independent businesswoman who runs Helena's Professional Documents, doesn't agree. She reports that, even though she followed Microsoft's instructions to the letter, she had to abandon DoubleSpace after losing programs and data on her mission-critical machine. "My PC *is* my business," says Fiorentini. "I'm not the most knowledgeable hardware-software person in the world, but for now DoubleSpace has me gun-shy about messing with my hard drive's files."

Judith Miner, a freelance writer and desktop publisher, is still using DoubleSpace despite a near-disastrous experience. After Windows crashed one day, she found her compressed drive file corrupted beyond use. The damage was so severe that the command DBLSPACE /CHKDSK froze the system instead of diagnosing the problem. Luckily, Miner was able to wipe everything off her drive, reinstall DoubleSpace, and restore the data from a recent backup. Her advice to other users: "Back up, back up, back up! If you're backed up, you have nothing to fear."

Backing up is always a good idea, but some users who back up infrequently or are concerned about losing data they generated between backups take another approach. All the disk compression programs on the market allow you to compress only *part* of your drive. By placing only programs, which can be restored from the original distribution disks, on the compressed drive, their precious data remains in a safe, uncompressed form. The downside of this method? If you lose the compressed portion, you may need to spend a long time reinstalling applications.

Harry Sutton: "DoubleSpace has been rock solid for me and those in my office who use it." Helen Fiorentini: "My PC is my business, [and] DoubleSpace has made me gun-shy."

The Bottom Line

Disk compression is a simple, quick, inexpensive way to boost your system's hard disk capacity. But is it worth the risk and the performance penalties? The answer appears, as is usually the case, to be financial. If money were no object, everyone I interviewed would have bought a larger hard drive rather than use compression. But in the real world, money is an object (unless you happen to be Bill Gates). If the cost of a new drive would hurt your wallet significantly enough to make a small performance hit bearable, you should go ahead and compress. And back up regularly.

Brett Glass is a contributing editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).*

Other Ways to Expand Storage

If you're hesitant about using a disk compression program, there are other ways to increase your storage capacity. The most obvious is to bite the bullet and buy another hard drive. If you do you'll pay approximately $1 per megabyte by mail order—less if you go for a reconditioned drive, more if you need a proprietary model.

Getting a drive and having it installed (or installing it yourself) isn't always painless, however. If you buy an IDE drive, for instance, you may find that it won't coexist with your older drive or with a drive and controller that use an MFM, RLL, or ESDI interface. In fact, you might have to retire your old drive, even if it still works. Then you'll probably need to tinker with CMOS settings and formatting programs before you can use your new drive (if you're lucky).

Another solution is removable media—the cartridge drives made by SyQuest, Iomega (Bernoulli), and others. The good news about these drives is that you'll never run out of storage—as long as you keep buying cartridges. The bad news is that these drives don't save you money; they just let you spend it a little at a time. Cartridges are nearly as expensive as hard disk space—from 50 cents to $1 per megabyte after you've bought the more expensive drive. Finally, there's a speed penalty far in excess of compression's: Removable cartridge drives have access times at least twice as long as those of a good hard drive.

Finally, you can use file-archiving programs such as PKZip, which also compress your data, but not on the fly. You'll need either to decide what to compress and add it to an archive manually, or to develop clever batch files that periodically handle the task. PKZip has a notoriously difficult command-line interface, but many DOS and Windows file-management utilities—such as PC Tools, Norton Commander, XTree, and Outside In—let you handle your ZIP files almost as easily as you do directories.

WHERE TO BUY

MS-DOS 6.2
List price: $77.95
Microsoft Corp.
800/426-9400
Reader service no. 697

SpaceManager
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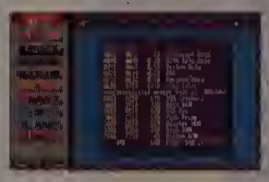

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How we got the chart numbers: CPU=486/33 ALR Power/business VESA machine equipped with 16 megs of RAM and running MS-DOS 6. Comparisons were done using the following memory managers, QEMM 7, QEMM 6.02, MS-DOS 6 MemMaker. In addition to the driver (or drivers) required by each memory manager, the following drivers, DOS resources and programs were loaded for all comparisons, in the CONFIG.SYS file: SETVER.EXE, DOS=HIGH, FILES=20, BUFFERS=10, STACKS=0,0 MVSOUND.SYS, SNDBK12.SYS, SUCD.SYS, DOS SHELL=statement, in the AUTOEXEC.BAT file: VSAFE, MSCDEX, UNDELETE, LSL.COM, NE2000.COM, IPXODI.COM, NETX.OR EMSNETX, MOUSE.COM, SMARTDRV.COM, PRTSC.CAP.COM. ©1993 Quarterdeck Office Systems. Trademarks are property of their respective owners.

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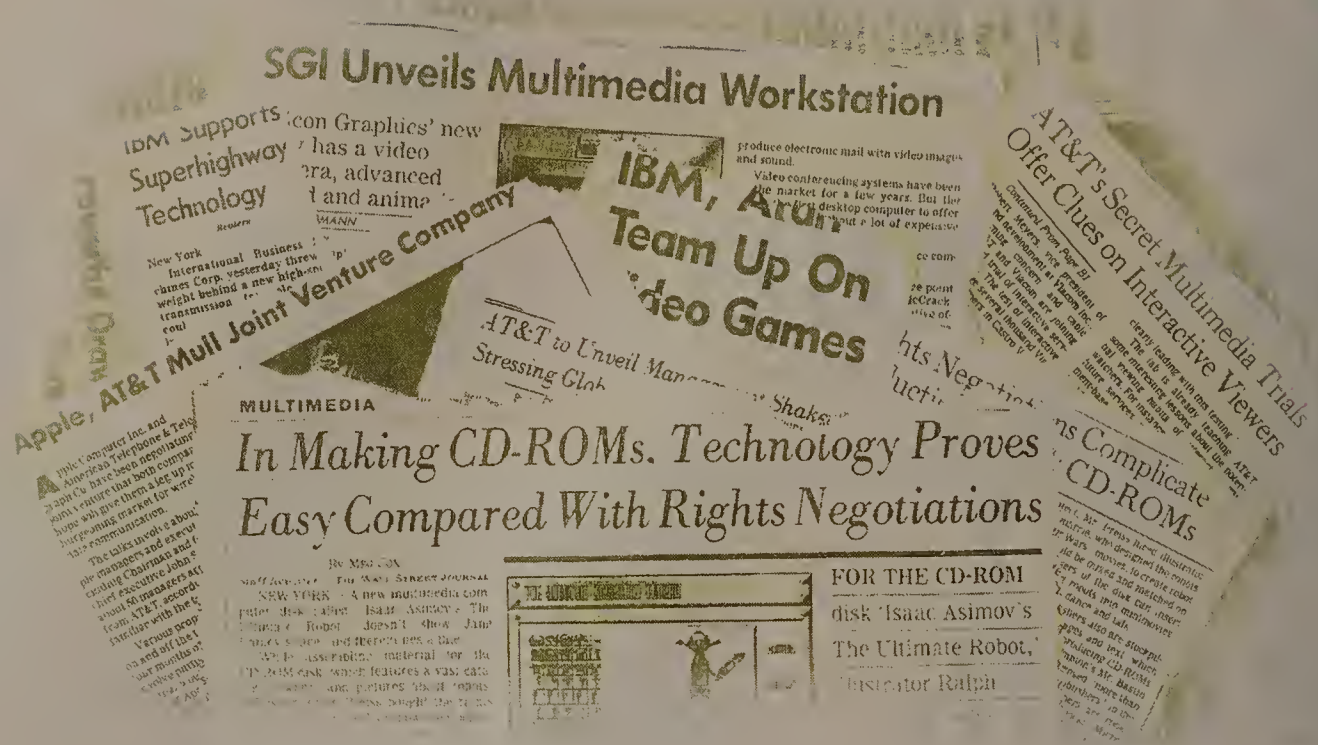

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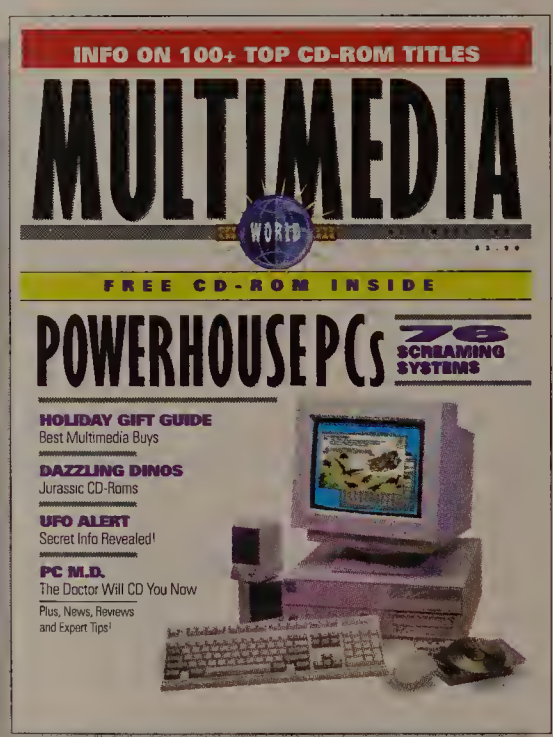

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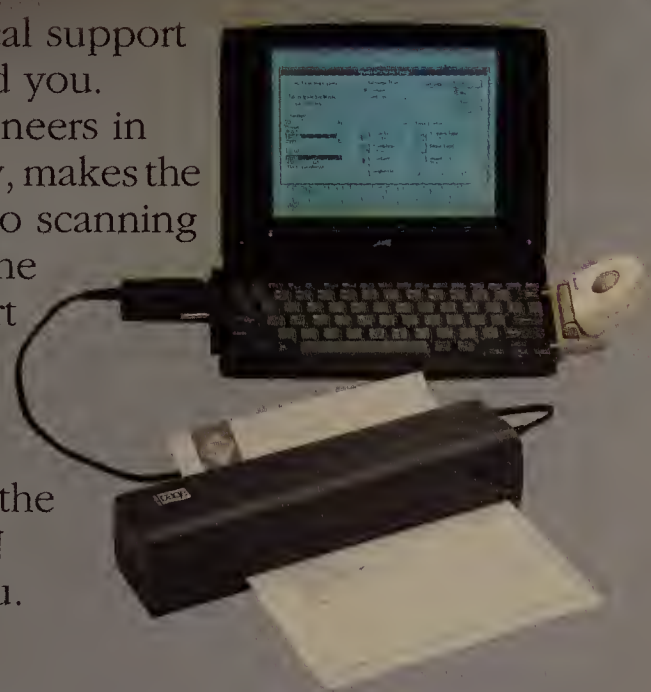

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Ink Jet Printers

Laser Quality for $300

Dreaming of a printer to call your own? Deciding which kind of machine to buy is especially hard if you're accustomed to laser printer quality but you have a dot matrix budget. Luckily, you can get professional-looking printouts without decimating your bank account. How? Buy an ink jet printer.

Ink jets crank out professional-quality text and graphics at less than half the cost of most personal lasers—many cost less than $300. They're also smaller, quieter, and they use far less power than their toner-melting cousins. That's one reason, according to International Data Corporation, why ink jet sales are growing faster than sales of any other kind of printer.

Of course, choosing an ink jet over a laser involves trade-offs; you'll have to give up some speed and paper-handling and font capabilities. But if you need a personal printer for everyday print jobs, you're tired of being stuck in network printer traffic, or you simply want to trade in your old dot matrix for a sportier model, ink jets offer a compelling alternative. And if you're stocking a home office, an ink jet may prove the ideal choice.

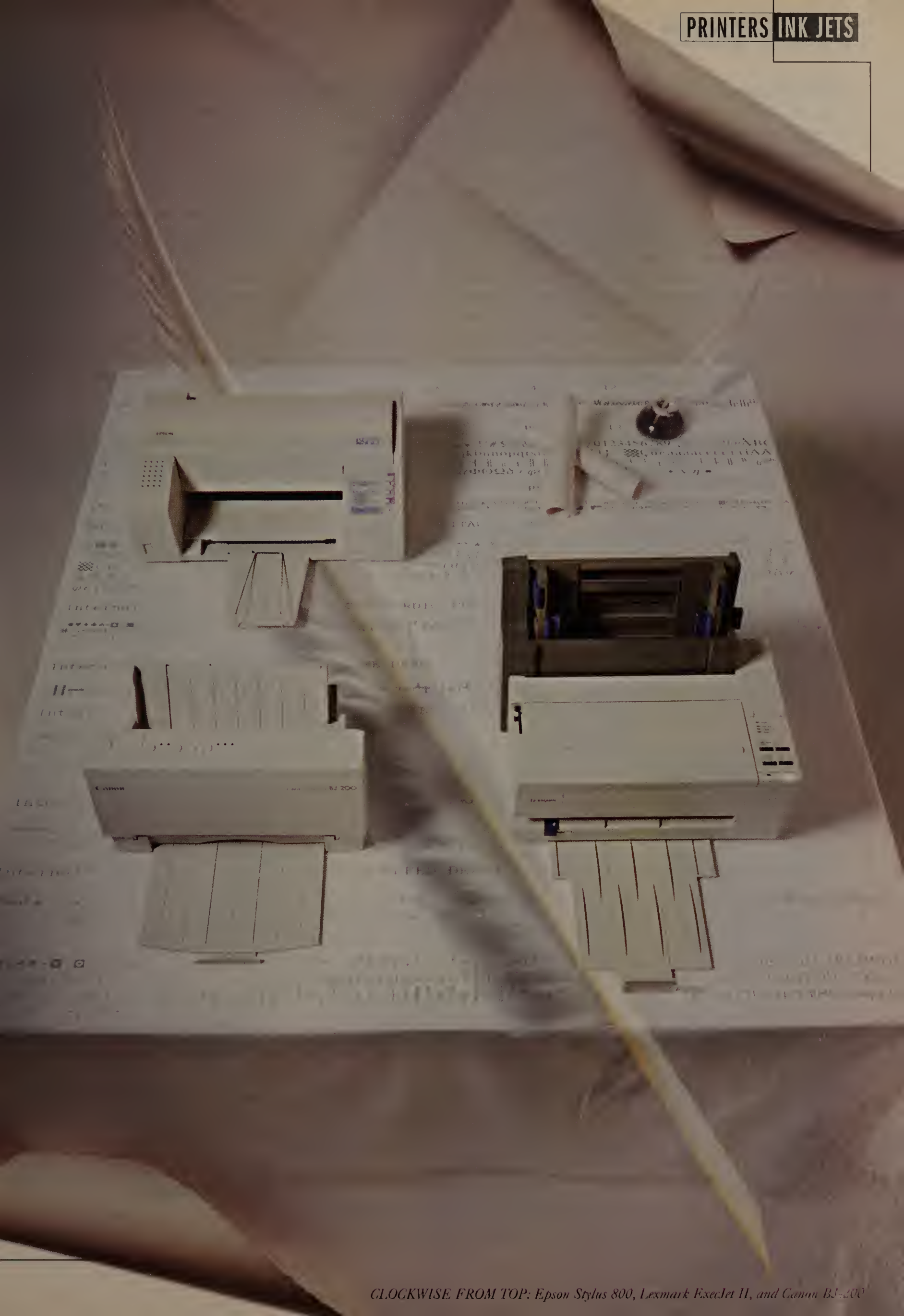
These eight compact, quiet printers deliver high-quality pages for pennies. The compromise? Speed.

By Daniel Tynan

The real question is whether an ink jet printer is the right compromise between laser quality and dot matrix price. To find out, we tested eight desktop ink jets costing from $275 to $350 on the street, from standard-setters such as Hewlett-Packard's DeskJet 500 and Canon's BJ-200 to the newest models from Lexmark, C-Tech Electronics, and Texas Instruments. All boast resolutions of 300 dpi or better, come with built-in sheet feeders, and are small enough to fit on even the most cramped desktop.

We wanted to see not only how these ink jets stack up against each other, but also how they measure up against their laser competitors. Since ink jets are budget machines, we gave top priority to price. Because they may be purchased in lieu of a laser, we demanded professional-looking output and adequate print speeds. Finally, we considered the intelligence of each printer's design, as well as its ease of use—key issues for machines aimed at individual users.

PHOTOS: GILES HANCOCK; IMAGING: MARK COOPER



CLOCKWISE FROM TOP: Epson Stylus 800, Lexmark ExecJet II, and Canon BJ-200

Prints Charming

There are at least 300 reasons for buying an ink jet—one for each dollar you save by not buying a laser. At $275, Canon's BJ-200 compares quite nicely with even 24-pin dot matrix printers. The most expensive ink jet here, Epson's Stylus 800 still costs only $350—hundreds less than the cheapest laser.

But street price is only part of the cost equation; you also need to factor in the cost of consumables. With dot matrix printers, the costs are negligible—a fraction of a penny per page—but with most lasers you pay about 3 cents per page. With these ink jets, you can expect to pay from 2 to 4 cents per page. That's because you need to swap in a new printhead–ink cartridge every 1000 to 2000 pages, and cartridges range in price from $20 to $50. Your actual costs will vary depending on the kind of printing you do—graphics cost more than text does. The figures we quote are based on vendor estimates for text documents, in which the ink covers approximately 5 percent of the page. If you print a lot of graphics (which require more ink), the cost per page increases considerably.

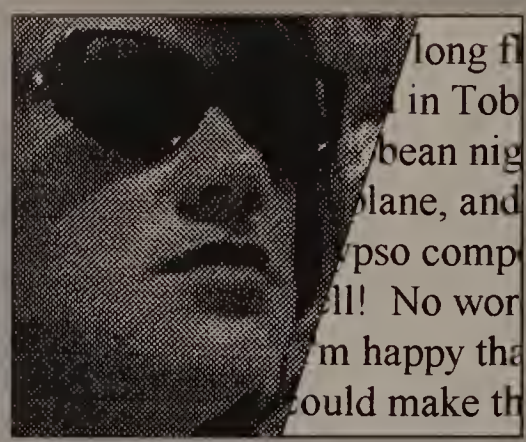
Quality Takes Time

Even if these printers cost hundreds less than a laser, however, you won't use one unless it produces professional-quality output. While ink jets can't compete with lasers when it comes to printing graphics, they can be surprisingly effective for bread-and-butter business print jobs such as correspondence and spreadsheet charts.

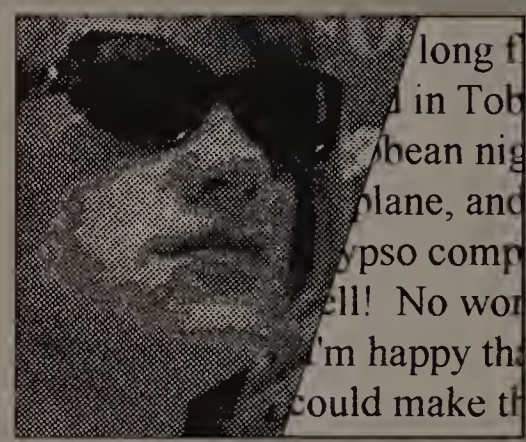
Unlike dot matrix printers, which create characters by striking an inked ribbon, or lasers, which use heat and pressure to apply dry ink (toner), ink jets create text and graphics by spraying a fine stream of liquid ink onto the page. Because the ink goes on wet, it can smear more easily and it sometimes spreads as it dries, giving your pages a fuzzy look. Exactly how fuzzy depends on the kind of paper you use—that's why we examined printouts on letterhead,

Laser Quality? You Be the Judge

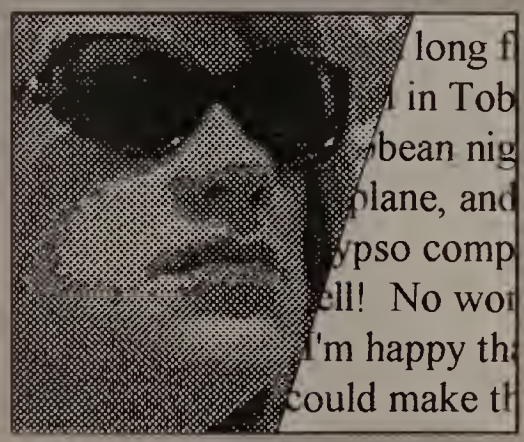
ACCORDING TO OUR JUDGES, Brother's HJ-400 and Epson's Stylus 800 produced excellent text output. However, the Brother had problems with graphics jobs; when it printed images at all, they came out muddy. The C. Itoh CJ-300 and TI microMarc, on the other hand, excelled at graphics but had trouble with text. So what do you do if you want high-quality text *and* graphics? For our money, the Canon BJ-200 and Epson Stylus 800 produced the best overall output.



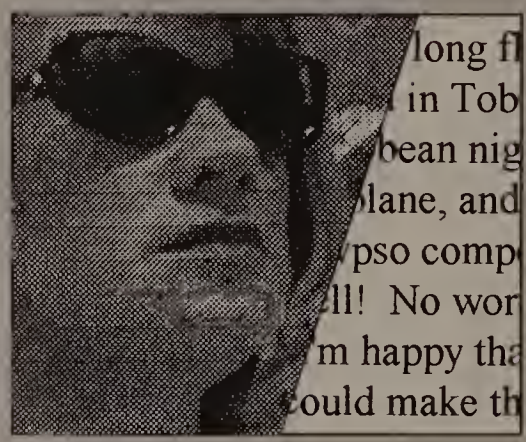
Brother HJ-400



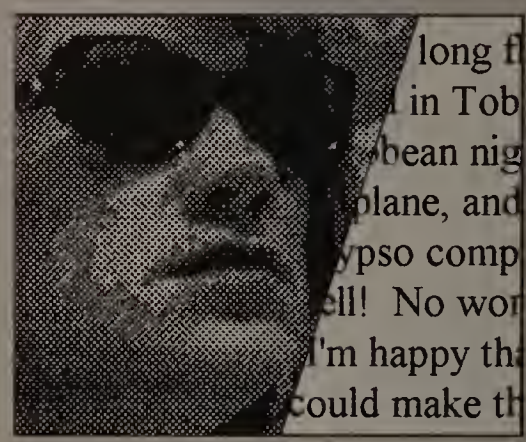
Canon BJ-200



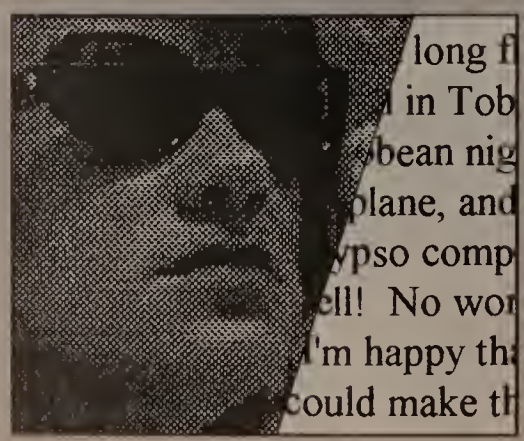
C. Itoh ProWriter SpeedJet CJ-300



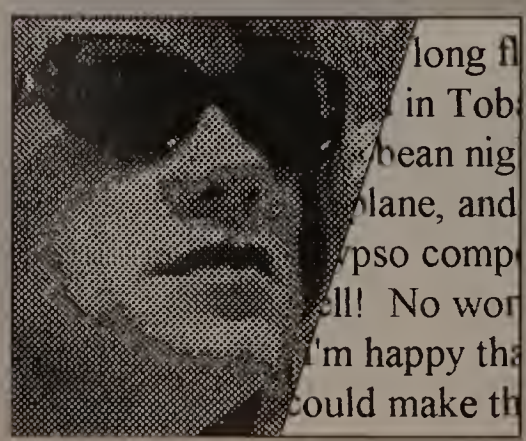
Epson Stylus 800



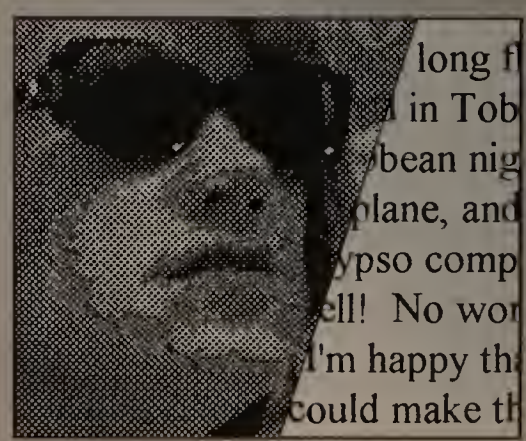
Hewlett-Packard DeskJet 500



Lexmark ExecJet II



NEC Jetmate 1000



Texas Instruments microMarc

recycled paper, and transparencies as well as photocopier stock. We also applied the greasy digit test—running a wet thumb across the page—to gauge smearing.

Because rating output quality is subjective, we asked a panel of users to look at and rate some print samples from these ink jets—a typical business letter and a full-page scanned photo. As a basis for comparison, we slipped in a few printouts from standard 300-dpi HP lasers.

It turns out that some ink jet printers are actually faster than laser printers when it comes to printing single-page text documents.

The results: Several of our judges actually preferred ink jet output to laser output. The Brother HJ-400 and Epson Stylus 800 cranked out the sharpest text, while the C. Itoh CJ-300 and TI microMarc produced the slickest graphics on all kinds of paper. Although no ink jet output was completely free from smearing, the HP DeskJet did the best job when the going got wet.

While you need adequate output quality, you also want your printouts quickly. It turns out some ink jets are actually faster than lasers when printing single-page text documents. That's because lasers need more time than ink jets to process the first page of a document. However, once the laser's print engine gears up—especially when printing longer documents or graphics—the ink jet's advantage evaporates quickly.

The fastest ink jet here, the Texas Instruments microMarc, cranked out a one-page Excel worksheet in less than 30 seconds—a better speed score than all but two of the personal laser printers we reviewed in July (see "Laser Printers From $700"). But this same printer was almost 30 percent *slower* than the most laggardly laser when it came to printing a three-page WordPerfect document.

In general, you sacrifice speed when you choose an ink jet. Of course, performance varies depending on the drivers and fonts you use, as well as the amount of printer memory. And because a ink jets (like dot matrixes) have far less RAM capacity than lasers, they often slow down your system as their memory buffer empties and refills, especially with graphics (a good reason to add more memory to your ink jet). Windows is particularly sluggish while printing to an ink jet.

Print and Play

Even a fast printer is too slow if you have to dig into the manual to figure out how it works. Ideally, you should be able to unpack a printer, plug it in, install the software drivers, and start printing—without even glancing at the user manual. The front panel controls should be easy to use and able to alert you when things go sour. While none of these ink jets provide the LCD screen found on most lasers, the best feature buttons for reset and manual-feed modes and LEDs indicating when the ink is low or you're out of paper. Nobody can touch Lexmark's ExecJet II for intelligent, easy-to-use design.

A personal printer should also be, well, personal—and that means small and quiet. As a rule, ink jets are easier on the ears than either lasers or dot matrix machines, and no other desktop printer can match the 6.6-pound Canon for size.

Fonts Upon a Time

In the not-too-distant past, a printer's built-in fonts made the difference between professional-quality pages and amateur productions. Now, thanks to Windows 3.1 and TrueType, you can print snazzy-looking typefaces regardless of which fonts are inside the printer. However, if you use DOS apps, you'll still want lots of fonts and a big memory buffer that can handle downloaded soft fonts, as well as spool print jobs. The NEC comes with the most bit-mapped fonts, but only Epson and Lexmark offer scalable typefaces.

All of these ink jets come with paper feeders that handle 100 cut sheets or more—a bit less than most lasers. But in a personal printer, variety is more important than volume: The printer should accept letter- and legal-size paper, envelopes, labels, and transparencies (you'll have to use special ink jet transparency film). While all the printers offer comparable paper capacity, the Canon and Lexmark get high marks for their ability to feed envelopes and transparencies.

Finally, when disaster strikes, your best defense is a solid warranty and reliable tech support. Many vendors now offer two-year warranties, but only HP offers three years of protection. Overall, Epson offers the best combination of toll-free phone help, long support hours, and short turnarounds on repair.

Inkredible Deals

Picking a winner out of this crew was no easy task. Ultimately our Best Buy came down to the smallest contes-

Best Buy

For just $275 on the street, the Canon BJ-200 does everything you could ask of an ink jet printer. Its output is closer to that of a laser than any other printer here, its speed is acceptable, it won't take up much room on your desk, and it features the lowest price in the review. That combination of skills makes the BJ-200 our choice as Best Buy.

THE CANON BEAT out some stiff competition—including the well-designed Lexmark and HP's perennial DeskJet—to earn a Best Buy.

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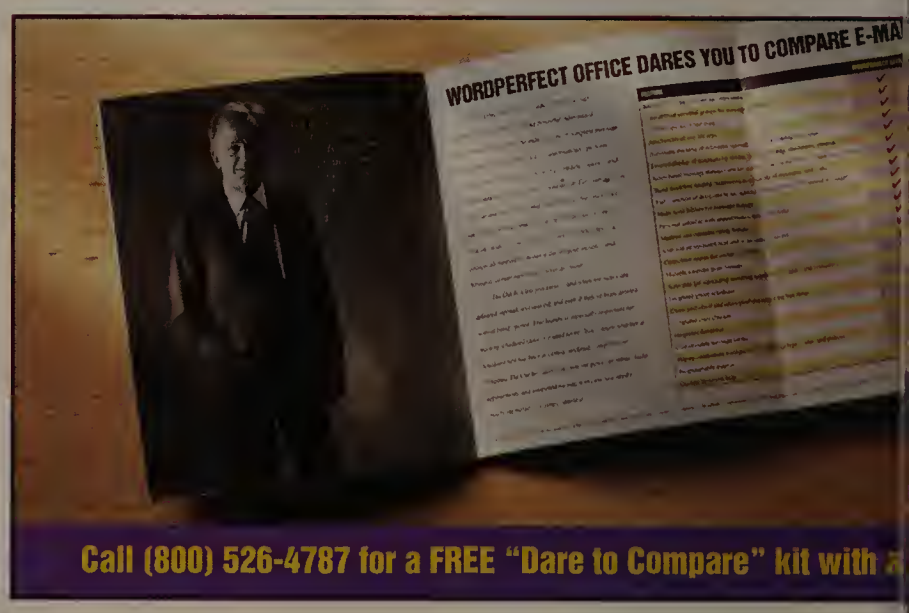

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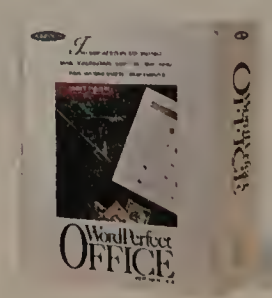


tant: the Canon BJ-200. While it didn't dominate any category, the BJ-200 offers the best combination of output quality, speed, and design—as well as having the lowest price. We also liked the Lexmark for its excellent design and the Epson, which garnered the best output scores overall. Machines like the Canon prove that you can find the personal printer of your dreams without depleting your budget. For just a few hundred dollars you can get professional-quality output, and you'll sleep better at night knowing that the extra cash is sitting in the bank, not on top of your desk.

Daniel Tynan is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 903.

Brother HJ-400

VITAL STATISTICS

Estimated street price: $299
PROS: Sharp text output, compact design
CONS: Slow, erratic graphics output
Contact: Brother Int'l Corp., 800/284-4357, 714/859-9700
Reader service no. 601

At times, Brother's HJ-400 is one terrific printer. This handsome $299 unit churned out the sharpest text in the bunch, and it comes with 30 TrueType fonts on disk. It's the only ink jet with both a built-in Macintosh port and a parallel port, and it switches between them automatically.

When it came to graphics output, however, the HJ-400 acted like the Brother from another planet. Some of our graphics print jobs came out as a jumble of alien-looking ASCII characters, and images that did print often looked muddy or bleached. The Brother's Windows driver offers minimal control over contrast and ink density, and the HJ-400 can't use drivers for any other printers.

The HJ-400's control panel is deceptively complicated, and instructions in the manual are not always accurate. To top it off, the HJ-400 is the slowest in the group. If you want to share a printer between a Mac and PC, the HJ-400 is a solid, low-cost option. Otherwise, we advise you to look elsewhere.

Canon BJ-200

VITAL STATISTICS

Estimated street price: $275
PROS: Tiny, cheap, fast, good-looking output
CONS: Limited control panel, noisy
Contact: Canon, 800/848-4123, 714/438-3000
Reader service no. 602

Canon's BJ-200 is proof that good things come in small packages. Despite being the lowest-priced printer in the roundup, our $275 Best Buy was good at just about everything, ranking in the top three for speed, output, and design.

Thanks to Canon's unique super-high-quality mode (SHQ), this 6.6-pound marvel produces some of the most laserlike text output we've seen from an ink jet. Characters look as sharp on letterhead as they do on plain bond. We found some slight banding in gray shades on graphics jobs, but blacks are dense and evenly colored, and lines are free from jaggies. The downside: Printing with SHQ takes 30 to 60 percent longer than in normal mode.

Of course, no printer's perfect. Despite its low 42db rating, the BJ-200 was noisier to our ears than most ink jets (though it's still quieter than a laser). Also, the control panel is a little too spare and lacks a reset button. But we can live with these faults. Canon's BJ-200 makes a fine addition to any desktop—and an excellent alternative to a laser—at a price that's hard to beat.

C-Tech Electronics C. Itoh ProWriter SpeedJet CJ-300

VITAL STATISTICS

Estimated street price: $329
PROS: Fast, excellent graphics
CONS: Inconsistent text output, erratic behavior
Contact: C-Tech Electronics, Inc., 714/833-1165
Reader service no. 603

The $329 C. Itoh CJ-300 bears a striking resemblance to the NEC and Texas Instrument printers. No wonder: The three share the same TEC-designed engine, which results in similar overall designs. From the outside they look like triplets, but inside they differ significantly. For example, the CJ-300's small 16K buffer can be increased to 512K—larger than the NEC's or the Texas Instruments'—to make room for spooling print jobs and downloading fonts. DOS users will need it because the C. Itoh comes with only four internal bit-mapped typefaces.

The CJ-300 cranked out some great-looking images, tying TI's microMarc for top graphics output on our judges' scorecards. Text output was shakier, with characters looking a bit wiggly. The aptly named SpeedJet is also fast, especially with graphics; it ranked second overall in our speed test.

Unfortunately, the CJ-300's front panel controls are less than intuitive. And, like the Brother, it's prone to erratic behavior, such as spewing out pages of garbage characters after a canceled print job.

The SpeedJet's graphics skills are mighty attractive. But if you're picky about text quality and you want a printer that's easy to use, the Canon is a better deal.

Epson Stylus 800

VITAL STATISTICS

Estimated street price: $350
PROS: Excellent output, scalable fonts
CONS: Paper-handling problems, relatively expensive
Contact: Epson, 800/289-3776, 310/782-0770
Reader service no. 604

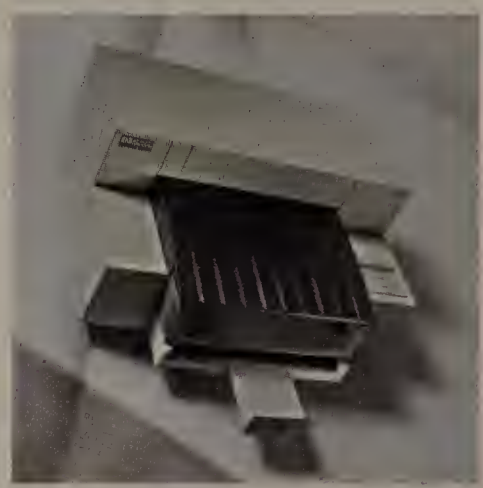
Epson knows printers. The company has long ruled the dot matrix market, and it's won two *PC World* Best Buys for its personal lasers. No wonder the $350 Stylus 800 impressed us.

The Stylus 800 received the best overall score for text and graphics. Type is sharp and readable, whether printed at 6 or 127 points. And line art and scanned photos printed almost flawlessly, without requiring that we fiddle with the driver's darkness or contrast settings.

Like the Lexmark, the Stylus comes with DOS drivers on disk, plus built-in scalable fonts—good news for non-Windows users. While installing the ink cartridge is a little tricky, the Epson is otherwise easy to get up and printing, and its front panel is nicely straightforward.

Unfortunately, the Stylus chewed up paper like it was on a high-fiber diet. It suffered frequent misfeeds and jams when printing on plain paper and was even fussier when it came to transparencies and labels. Considering these problems and the printer's high price tag, the Epson falls a bit short of the mark set by the Canon. But if you want high-quality output and don't mind some paper hassles, the Stylus is a great choice.

Hewlett-Packard DeskJet 500



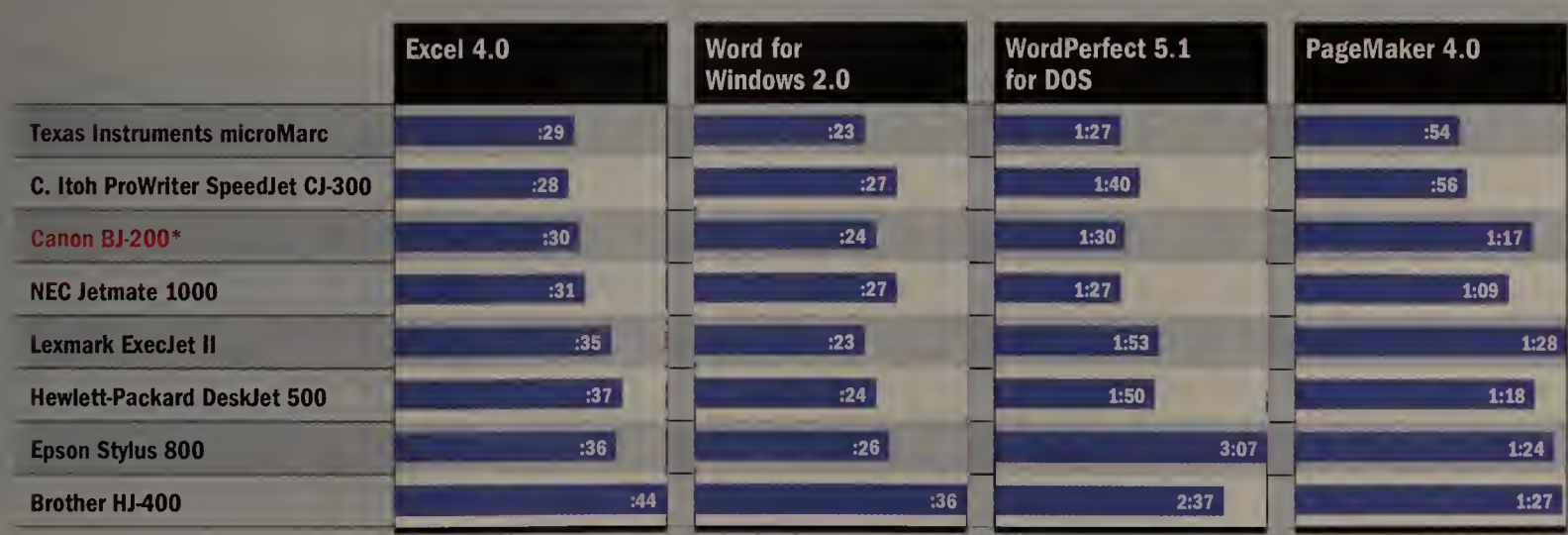
VITAL STATISTICS

Estimated street price: $300
PROS: Easy to use, good paper handling, three-year warranty
CONS: Mediocre output, relatively large
Contact: Hewlett-Packard, 800/752-0900
Reader service no. 605

Every couple of years, HP releases a new version of the DeskJet and sets a new standard for ink jet printers. So no review of desktop

PC WORLD TEST CENTER REPORT

Ink Jet Speed? They're No Lasers



*Best Buy

Printers are arranged in order of overall speed, from fastest at top to slowest at bottom. Test results are in minutes:seconds, measured from the time we issued the Print command to the time the completed page ejected from the printer.

Methodology
All printers were tested as configured by the vendor. Unless otherwise noted in text, we used the recommended drivers that shipped with the printer.

Each test was run twice on each printer. The first test was run right after the printer was turned on, before anything else was printed. The same test was then repeated to measure benefits from font and other types of caching. Scores are the average of both tests.

Excel 4.0
We printed a simple one-page spreadsheet file.

Word for Windows 2.0
We printed a single-page business letter.

WordPerfect 5.1 for DOS
We printed a three-page text document. The score is the total for all three pages.

PageMaker 4.0
We printed a text page in landscape orientation, with three columns of text, a black bar with reversed text, and a halftone image.

Data based on tests designed and conducted by the PC World Test Center. Testing performed by Jeff Eckert. All rights reserved.

ink jets would be complete without the current standard—the $300 DeskJet 500. The problem is, the 500 has been around so long that other vendors have had a chance to catch up with it.

Once considered petite, the 14-pound DeskJet is the bulkiest printer in the roundup. Fortunately, HP's control panel is still a model of simplicity. The printer generally handled paper like a pro, though you have to feed envelopes by hand and it won't accept transparencies.

The HP faltered more seriously on print quality. Text sometimes appeared fuzzy due to ink splatter, reversed type (white on black) was barely readable, and graphics were occasionally marred by horizontal white streaks. On the bright side, the DeskJet survived the greasy digit test with barely a smear.

While still a decent value, the DeskJet 500 is overdue for an overhaul. Don't be surprised if a spiffier model comes out later this year. If we were set on buying an HP, we'd wait until then.

Lexmark ExecJet II

VITAL STATISTICS

Estimated street price: $299
PROS: Excellent design, good paper handling, scalable fonts
CONS: Blurry text and streaky graphics
Contact: Lexmark Int'l Inc., 800/358-5835, 606/232-2000
Reader service no. 606

In a perfect world, all personal printers would be designed as well as Lexmark's $299 ExecJet II. This toaster-oven–size printer is truly a plug-and-print machine.

Lexmark's intelligent design starts with a DOS-based utility that installs drivers for applications it finds on the hard disk. The ExecJet's clever front panel is clear and informative, with buttons for controlling fonts and page orientation placed under a flip-up panel.

The ExecJet offers 12 built-in scalable fonts and lets you add up to 1MB of flash memory for storing more typefaces. Paper handling is also impressive: An easy-to-fill sheet feeder holds 150 pages—the most of any printer in this review—and 15 envelopes.

Unfortunately, the nice design isn't reflected in the ExecJet's output quality. A black-and-white scanned photo printed dark purple and was streaked with horizontal white lines. Text output was only slightly better—characters looked overinked and blurry, especially on letterhead. It's too bad, because the ExecJet is a printer truly designed with users in mind. If the output looked better, it would be an easy Best Buy.

NEC Jetmate 1000

VITAL STATISTICS

Estimated street price: $299
PROS: Excellent graphics, 24 built-in fonts
CONS: Inconsistent text output, poor telephone support
Contact: NEC Technologies, 800/632-4636, 508/264-8000
Reader service no. 607

NEC's Jetmate 1000 may be a dead ringer for the C. Itoh and Texas Instruments printers, but this $299 unit has a personality all its own—or, to be accurate, *two* personalities.

The split personality showed up in the output; like the microMarc and C. Itoh, it excelled at graphics but had trouble with text. Solid black areas printed without overinking and reversed type was crisp. But on text jobs, the printhead sometimes seemed to jog sideways in the middle of each line, giving the page a wavering, heat-mirage effect.

NEC's customer support is equally schizophrenic. We like the company's two-year warranty, toll-free number, and long support hours. But to get a human being on the phone we had to call three times—spending a total of 40 minutes on hold.

Still, the Jetmate boasts features such as 24 bit-mapped fonts and 20 Windows TrueType fonts on disk. It does a fine job with envelopes and suffered nary a paper jam. Unfortunately, it's just a little too inconsistent for our tastes.

Texas Instruments microMarc

VITAL STATISTICS

Estimated street price: $289
PROS: Fastest in review, excellent graphics
CONS: Printing errors
Contact: Texas Instruments, 800/527-3500
Reader service no. 608

Stop us if you think you've heard this one before: Texas Instruments' $289 microMarc shares some of the benefits and many of the liabilities of its NEC and C-Tech Electronics kin.

The microMarc's biggest benefits are speed and high-quality images. It received our judges' highest scores for printing scanned photos, and it was the fastest printer overall. Unfortunately, the microMarc also produces the wavy characters that bedevil the text output of the NEC Jetmate and C. Itoh SpeedJet.

In a perfect world, all personal printers would be designed as well as Lexmark's $299 ExecJet II. This printer is truly a plug-and-print machine.

We encountered some familiar problems with the microMarc—ASCII characters strung across the top of some pages, for example—as well as a few new glitches all its own. We were unable to print an envelope and experienced difficulty when printing PageMaker 4.0 text and graphics using the Texas Instruments–supplied Windows printer driver (we had to install a DeskJet 500 driver).

In other words, the microMarc involves some work. If you want fast and good-looking graphics output, this printer could be your cup of ink. Just be sure to keep the manual close at hand.

The Texas Instruments microMarc topped our judges' lists for printing scanned photos, and it was the fastest printer overall.

FEATURES COMPARISON

Near-Laser Quality at a Fraction of the Price

● Yes
○ No
n/a = not applicable

	Brother HJ-400	BEST BUY Canon BJ-200	C. Itoh ProWriter Speedjet CJ-300	Epson Stylus 800	Hewlett-Packard Desklet 500	Lexmark ExecJet II	NEC Jetmate 1000	Texas Instruments microMarc
Standard features								
Estimated street price	$299	$275	$329	$350	$300	$299	$299	$289
Estimated cost per page [1]	$0.02	$0.02	$0.04	$0.03	$0.04	$0.03	$0.03	$0.02
Maximum resolution (dpi)	360	360	300	360	300	300	300	300
Rated speed in draft/letter quality mode (characters per second)	110/110	248/173	300/300	n/a / 180	240/120	360/200	300/300	300/300
Standard memory (K)	64	49	16	8[2]	16	21	128	24
Fonts and emulations								
Internal fonts (bit-mapped/scalable)	12/0	7/0	4/0	5/4	4/0	2/12	24/0	12/0
Font cartridge slots	0	0	2	0	2	0[3]	2	2
Emulates HP DeskJet series	○	○	●	○	●	●	●	●
Ships with drivers for								
Windows 3.1	●	●	●	●	●	●	●	●
WordPerfect 5.1 and 6.0 (DOS)	○[4]	○[4]	○	●	●	●	○	●
Lotus 1-2-3 2.x and 3.x (DOS)	○	○[4]	○	●	○[4]	●	○	●
Design and paper handling								
Footprint (square inches)	174	104	204	175	256	159	204	204
Weight (pounds)	8.6	6.6	12.1	11	14.3	11	12.1	12.1
Reset button	●	○	●	●	●	●	●	●
Incoming data indicator	●	○	●	●	●	●	●	●
Paper-out indicator	○	○	○	●	○	●	○	○
Low-ink indicator	○	○	○	●	○	●	○	○
Serial port	●	○	○[4]	○	●	○[4]	○[4]	○
Standard input capacity (sheets)	100	100	100	100	100	150	100	100
Maximum output tray capacity (sheets)	20	100	20	30	50	75	20	20
Prints transparencies and labels	●	●	●	●	○	●	●	○[5]
Service and support								
Warranty (years)	2	2	2	2	3	2	2	1
Toll-free tech support	●	●	●	●	○	○[6]	●	●
Daily support hours (weekdays)	9	11	8	12	11	9	12	12
On-site service	○[4]	○	○	○	○	○	○	○
Average turnaround on repairs (days) [1]	2	none	10	2	1	1	1	2
Fax/BBS support	●	●	●	●	●	●	○[7]	●

[1] According to vendor.
[2] Upgrade to 32K available.
[3] Optional flash RAM available for storing fonts.
[4] Optional.
[5] Transparencies only.
[6] Call-back service.
[7] BBS only.

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- 4.4 lbs.

T3400
- 8.4" STN monochrome display
- 7.9" x 9.9" x 1.7"
- 4.1 lbs.

Both Models
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- 4MB RAM (expandable to 20MB)
- Lithium-Ion battery
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- Integrated BitBLT graphics accelerator
- VL-local bus video
- Ports: serial, parallel, FDD, Port replicator, and VGA adapter
- Windows™ 3.1, DOS™ 6.0, CommWorks™ for Windows

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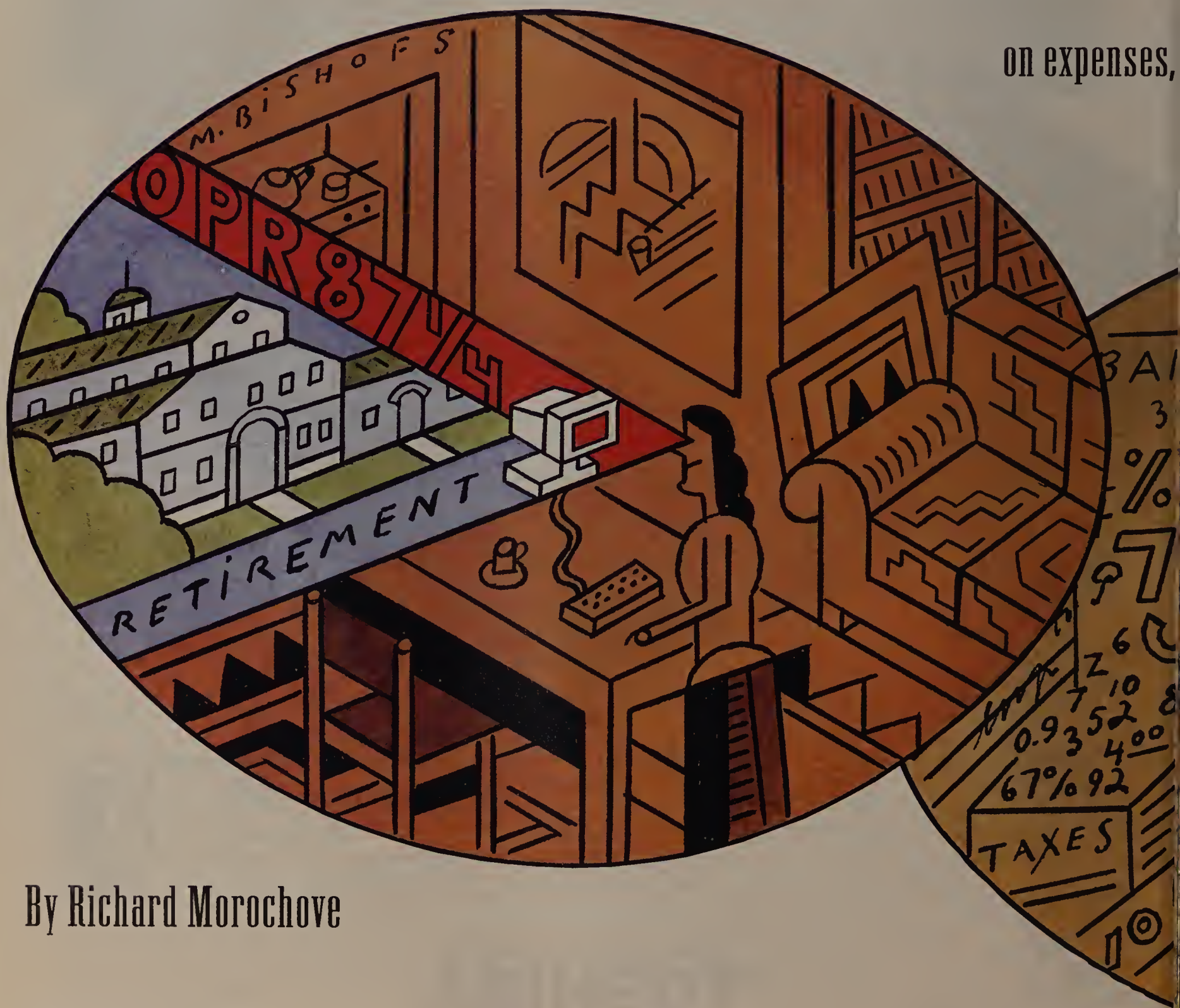
Sound Investments

Personal Finance

Want to get rich quick? These

on expenses,



By Richard Morochove

Software

seven packages don't promise that, but they will help you keep tabs manage investments, and plan for college, retirement, and other financial goals.

MARIS BISHOFS

Quick: What's your checking account balance? Where does all your money go each month? If, like most people, you don't know for sure until your bank statement arrives, personal finance software can help you keep tabs on your money.

The new crop of programs makes it easier than ever to track your finances, print checks, and reconcile your checkbook records with your bank statement. Even better, these programs provide more insight into your expenses than a traditional manual system ever could. You can set up a budget, for example, and then compare it against your actual expenses every month. Or you can get a jump on paying your taxes by having all your expenses categorized neatly by the end of the year.

Of the seven personal finance packages we look at in this article, five are for Windows and two are for DOS. All of these packages are reasonably priced at under $80, and all handle the basics of tracking expenses, reconciling accounts, and printing checks. Basic packages such as WinCheck limit themselves to these activities. At the

other end of the spectrum are packages such as Managing Your Money, which also include the capabilities to manage, track, and help you increase your financial portfolio.

Paying Your Dues

All of the programs let you print checks. Since you probably write a group of checks to the same merchants every month, this feature will save you time, once you enter basic payment data. However, you'll need special check forms for your printer, and it pays to shop around. For cost-comparison details, see "A Consumer's Guide to Printed Checks." Even if you don't want to print your checks, a personal finance program can offer a quick way to track your bank balance. Alternatively, you can pay bills without even using checks. Most of the programs offer links to electronic payment services such as CheckFree (see "Money on the Wire").

Analyzing Your Expenses

All of the programs here can track your bills, but the capability to analyze your spending patterns is another story. Better programs let you compare this year's expenses with last year's, as well as against a preset budget you provide, so you can see where spending is out of whack. Microsoft Money and Quicken make it easier to create a budget by using your historical spending patterns as a guide.

One of your biggest expenses is the one you settle every spring—your income taxes. It's important that a package allows you to identify which expenses are deductible. Some personal finance programs, such as Managing Your Money, even give you a fair estimate of how much you'll pay. None actually prints a 1040 form you can sign and file, but all except WinCheck allow you to transfer accumulated data to an income tax program.

Managing Your Portfolio

Only four of the programs reviewed do a reasonable job of managing your financial assets. Simply Money, Managing Your Money, and both versions of Quicken offer portfolio management capabilities that help you track the costs, income, and current market values of your securities. Better programs keep track of the historical trends of securities prices, not just the most recent quote. If you own many different securities, using a facility to import current market prices from an online service is much less time-consuming than keying in prices from newspaper stock tables.

People who depend on the income from their investments will want to be able to measure the current yields from their securities. Probably the most important measurement is the return on investment, a calculation of the annualized return that includes dividend and interest income, as well as any unrealized capital gains. Simply Money, Managing Your Money, and both versions of Quicken provide this capability.

Planning Your Future

Financial planning involves making the right decisions today so you can achieve your financial goals. Will you have enough spare cash to take that European vacation? Will you have enough money to retire in style? Is your financial net worth sufficient to start a new business?

Only two programs, Simply Money and Managing Your Money, come right out and give you financial advice, letting you know if you're on the right track or if you're neglecting some important financial considerations. Simply Money's financial adviser is a standout with its pop-up comments that are triggered as you complete key actions. But only Managing Your Money does a thorough job in this area because it also estimates future cash flow and net worth.

Buying Advice

Is there one personal finance program that has it all? Unfortunately, no. Both the DOS and Windows versions of Quicken are our Best Buys for managing your checkbook because they make it so easy. The Windows version features a few more capabilities and an easier-to-navigate graphical interface. But even with the improved portfolio management capabilities in these latest versions, Quicken stumbles when it comes to managing your financial assets.

Venerable, DOS-based Managing Your Money may look like it just escaped from the Jurassic Park for software, but it does an outstanding job of managing your assets and giving you financial advice. It's our Best Buy for managing your portfolio. But this isn't an easy program to learn; the archaic menu interface won't win many fans. A Windows version is in the works and will help make this powerhouse more approachable. If you need just the basics, look no further than WinCheck. It handles only your checkbook, but it's good at what it does.

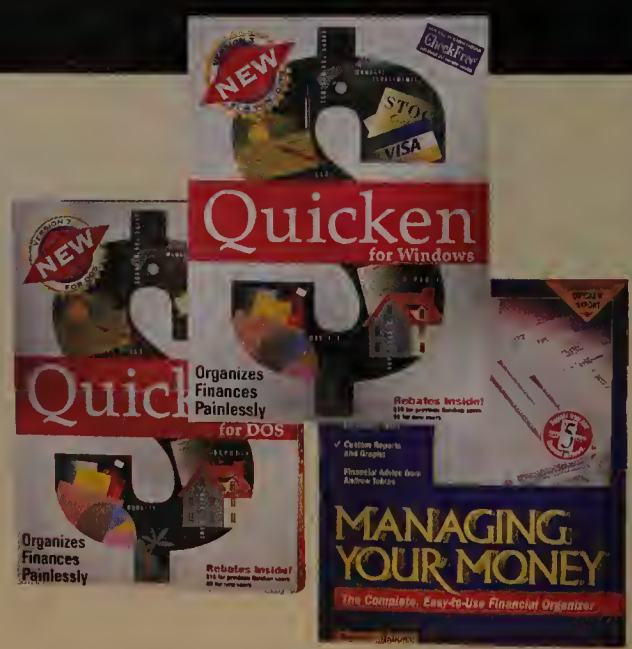
None of these packages is suitable for full business use. If you need a small-business accounting program, take a look at "Point-and-Click Accounting Software" (*PC World*, October 1992) for information about some of the best packages in that category.

Richard Morochove is a chartered accountant and president of Morochove & Associates, a Toronto consulting firm specializing in financial applications.

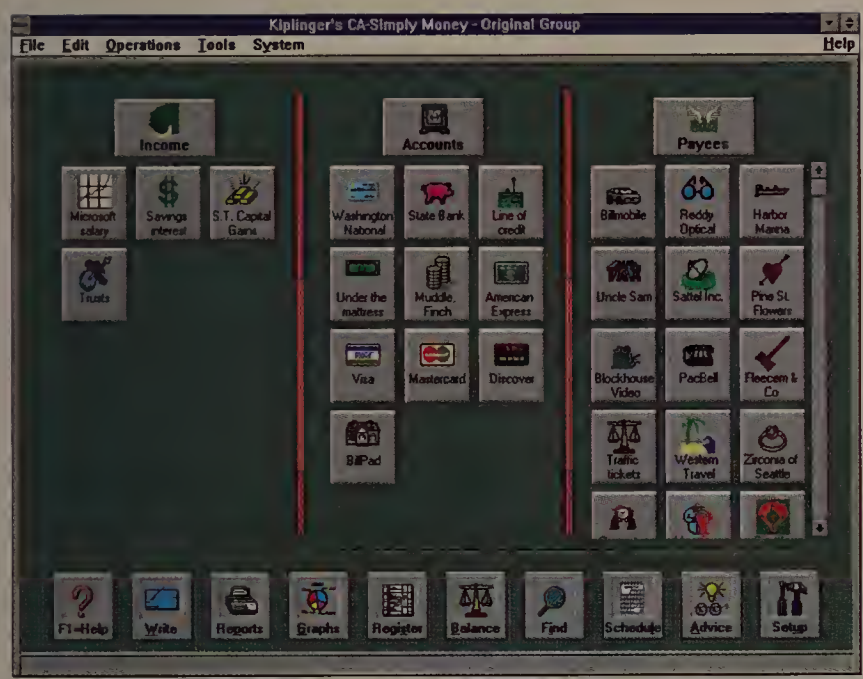
For more information about all products in this article, circle reader service no. 901.

Best Buys

Both versions of Quicken clearly win our Best Buy for checkbook management and for tracking the basic flow of your money. They also excel at budgeting and depicting graphically what happens to your money. But the Quicken packages stumble when it comes to investment advice, an area in which they fail to provide guidance on how to manage your finances better. Here Managing Your Money picks up where Quicken leaves off and wins a Best Buy for portfolio management. Kiplinger's CA-Simply Money is also a solid program, but it doesn't quite match the Best Buys in these areas.



QUICKEN IS BEST for checkbook management; Managing Your Money excels at financial advice.



CUSTOMIZED ICONS REPRESENT different accounts and expenses in Kiplinger's CA-Simply Money.

Kiplinger's CA-Simply Money 3.1

PROS: Judicious advice on how to manage your money better, knockout visual design, speedy navigation
CONS: Modifying account and payee details is awkward

WINDOWS Kiplinger's CA-Simply Money doesn't need its big name to make a big impression. It's one of only two personal finance programs that provides advice on how to manage your money, and its excellent design makes navigation simple.

Right off the bat, you notice the stunning visuals. The program's icons are simply marvelous, including miniature representations of credit cards, boats, and, of course, money. You can select from more than 200 icons to represent your sources of income, expenses, and bank and credit card accounts visually. This makes it easy to find the right category or account at a glance.

Simply Money's beauty is more than skin deep. The program offers financial advice that is both context- and goal-sensitive. You specify your security goals, such as growth, high return, low risk, income, or a college fund. When you set up accounts or enter other information, you may trigger the adviser. One item, for example, discusses how to establish your investment goals. If you aren't able to read the advice immediately, you can close the window and review it at another time.

Simply Money is easy to learn and help is readily available. If you float the cursor over an icon button, a line of help appears at the bottom of your screen. However, a few operations could be more intuitive. For example, to change an address for a payee, you must enter the setup portion of the program. It would be handier if you could simply click on the payee's icon and modify it directly.

Simply Money's portfolio management isn't quite as sophisticated as Managing Your Money's. For example, you won't find asset allocation modeling, which recommends the mix of stocks, bonds, and other securities you should hold to maximize your return for a specific degree of risk. However, as a Windows program, it's a lot friendlier to use. Simply Money also doesn't go quite as far as a program such as Quicken in helping determine your financial projections—future cash flow, for instance.

Overall, it's an impressive debut, just a few features shy of the leading programs and moderately priced at $69.99. Its ease of use makes it particularly suitable for managing your financial assets if you don't need the heavy-duty power of Managing Your Money but you do require solid financial advice. *Computer Associates Int'l, 516/342-5224.* **Reader service no. 609**

Managing Your Money 10.0

PROS: Top-notch portfolio management
CONS: Complicated to use, complex DOS interface

Managing Your Money is an everything-but-the-kitchen-sink type of program that provides advice based on the philosophy of financial guru Andrew Tobias. In this latest version, which carries a list price of $79.95, Meca Software decided to throw in the sink. This approach makes the program a bit unwieldy, but if your primary need is managing your financial assets, Managing Your Money is our Best Buy.

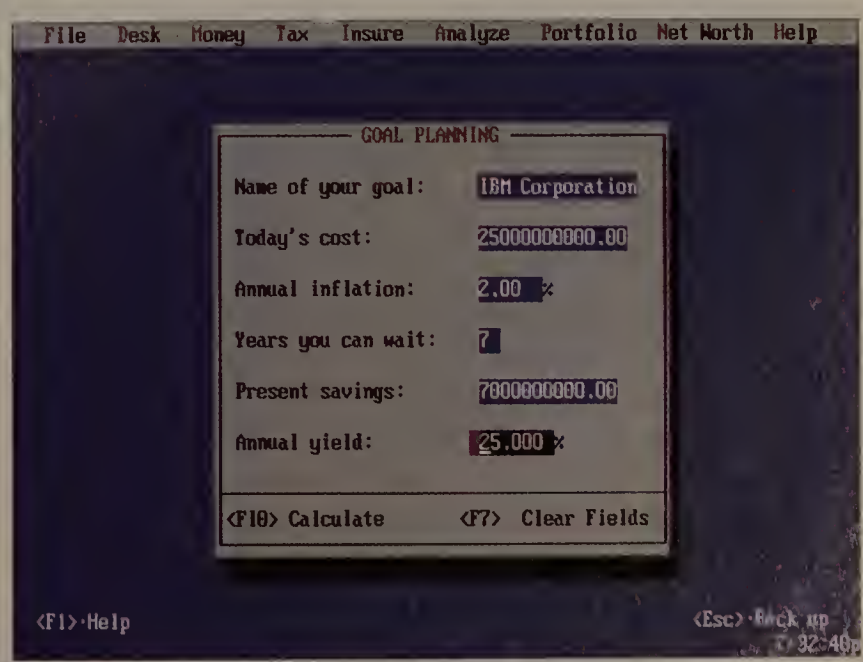
The program is particularly strong in portfolio and investment management. For example, you get a sophisticated asset allocation module that selects a mix of securities types to help you achieve your desired rate of return. A new automated setup procedure guides you gently through the process of establishing a portfolio.

Another key new feature is a debt-reduction module that helps you prepare a strategy for paying off your loans as quickly as possible. (No, Andrew Tobias doesn't recommend bank robbery.)

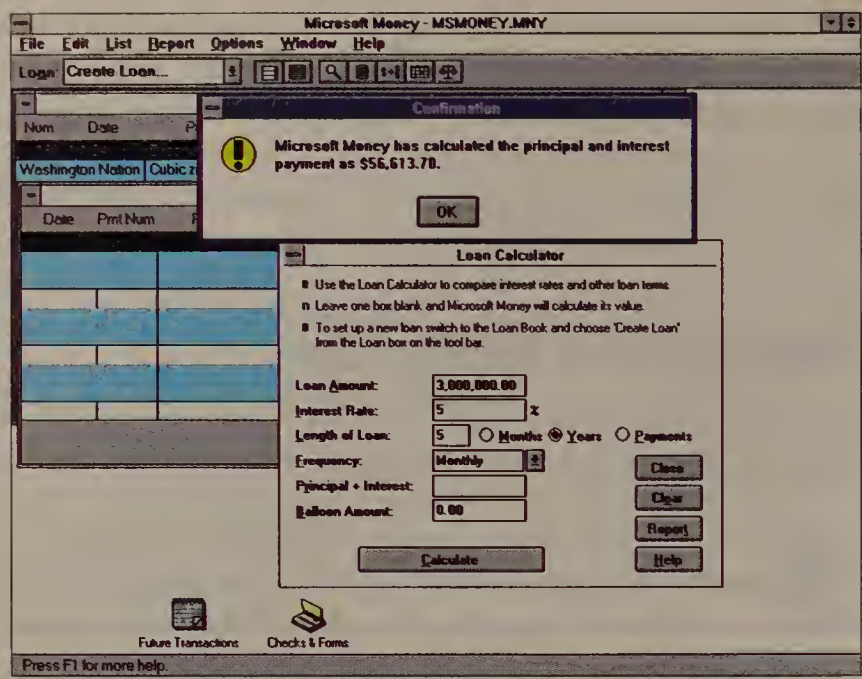
Tobias's pithy online comments are useful, and they give Managing Your Money an idiosyncratic flair. He even dares to criticize several program features.

With all the menu options, though, it's tough to discern what's where. The online help isn't completely indexed, so you must either know or guess which section of the program includes a particular feature.

Furthermore, the menu interface of this DOS program is a relic of the eighties, and it operates inconsistently. For example, when you scroll through a list of pulldown menu options, you hit <Enter> to select the option. But when scrolling through a list of help options, <Enter> doesn't work; you must use <F10> instead. Thankfully,



IS BUYING IBM one of your financial goals? Managing Your Money lets you develop a what-if plan for investments.



MICROSOFT MONEY'S LOAN CALCULATOR lets you see if you can afford to take out that big loan.

Meca Software is working on a Windows version that should be available sometime this spring.

Managing Your Money has the most comprehensive tax planning module of the programs we reviewed. Most other packages limit their involvement to tracking tax-related spending categories and exporting a data file to an income tax program. Managing Your Money goes well beyond that with a 1040 worksheet that actually estimates your income taxes. But you still need a tax program such as Meca's TaxCut to print a return you can file.

Managing Your Money also offers some small-business features, including P&L statements, balance sheets, and the capability to print invoices. The Social Security estimator is a unique tool that lets you determine just how little Uncle Sam will give you to live on when you retire.

You can even use the program as a kind of personal management system. It tracks scheduled appointments, telephone calls, to-do lists, and so on. Managing Your Money's only weak spot is that you really have to work to use it. It doesn't make it easy to pay your bills like Quicken does. But if Managing Your Money's superior portfolio management is most important to you, it's your Best Buy. *Meca Software, 800/820-7457, 203/255-1441.* **Reader service no. 610**

Microsoft Money 2.0

PROS: None
CONS: Lacks portfolio management and financial planning capabilities

WINDOWS Microsoft Money does an adequate job of checkbook management, but it isn't anything special. It handles all the standard operations: printing checks to pay your bills and tracking expenses so you can see where your money went at the end of the month. Unfortunately, they're all "me, too" features, implemented without flair. Although Money handles little more than WinCheck, it's considerably more difficult to use.

Budgets are usually tedious to set up, but Money's automatic budgeting feature can create a budget based on your previous spending patterns. This feature is also available in other personal finance programs, such as Quicken.

Loan tracking is another improvement in version 2.0. A Loan Wizard guides you through the steps to set up a loan. This feature handles calculations for either borrowing from or lending to others. If the Loan Wizard only filled out the loan application, too.

Money has reasonable graphing capabilities to show you trends in your expenses. Reports can be customized and saved in their modified form for regeneration in subsequent months.

As for financial planning, Money is a washout. Moreover, if you have a securities portfolio, the program isn't able to keep track of the details of your trades.

Investment tracking has been added to version 3.0 of Money (due out this month). With 3.0, you'll be able to pay your bills and check your stocks online. Microsoft has also teamed up with three banks—U.S. Bank, Michigan National, and First Chicago—to offer online banking services in the new version.

Money isn't a bad personal finance program; it does a workmanlike job of tracking your expenses. But if you need just the checkbook basics, WinCheck is easier to learn, less expensive (at list price), and more economical because of its cheaper check forms. If you want full-featured bill-paying capabilities, you'll be happier with Quicken for Windows. Microsoft Money just doesn't stand out as a leader in any area, and it's not a bargain at its $69.95 list price. *Microsoft Corp., 800/426-9400.* **Reader service no. 611**

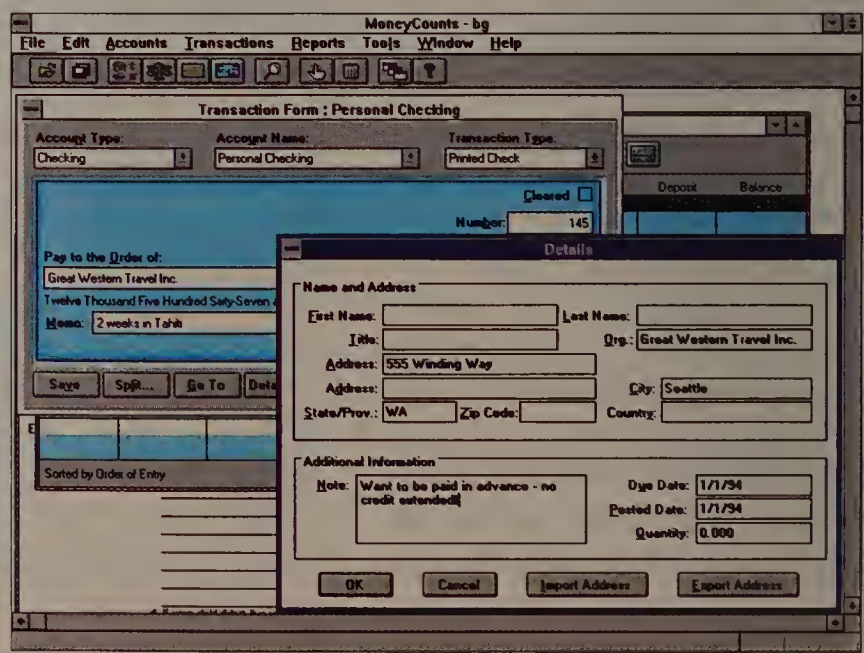
MoneyCounts for Windows 1.0a

PROS: Good financial reports for home businesses
CONS: Uses jargon only an accountant could love

WINDOWS MoneyCounts for Windows tries to straddle the needs of two distinct users: home-business owners and individuals who just want to track their personal finances. That the program almost manages to pull it off is a tribute to MoneyCounts' developers.

It's the only package here that comes set up for double-entry bookkeeping, the same system businesses use. However, you can turn off this option and revert to a simpler, single-entry method that better suits home users who aren't accountants.

MoneyCounts is one of the few packages that comes with business financial reports such as a general ledger and a trial balance.



MONEYCOUNTS' EXTRA NOTES FEATURE allows you to set reminders for each merchant you pay.

WE'D LIKE TO SPARE YOU THE UGLY SIGHT OF A LIVE SYSTEM CRASH.

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Your system locks up. Windows crashes again. Or you lose power. Suddenly, all the work you forgot to save disappears from the face of the earth. Forever. Unless, of course, you're protected by new PC Tools Pro for DOS. It has an ingenious new recovery feature called CPR, that can even bring back your unsaved work. (Norton Utilities can't.) PC Tools Pro also repairs and optimizes compressed drives and diagnoses the most elusive hardware problems. And protects you from all computer viruses known to man. (Norton won't.) It even lets you do automatic backup. (Norton doesn't.) But that's not all. For a more revealing comparison of PC Tools Pro vs. Norton, call FAXBACK at 1-800-847-8766 and ask for document 97529. For all upgrades, just call 1-800-277-3946.

UPGRADE FROM PC TOOLS, NORTON OR FASTBACK ONLY $49.95* 1-800-277-3946

*Upgrade from PC Tools, Norton Utilities, Fastback or XTree. Offer expires February 28, 1994. Offer good only in U.S. and Canada. Shipping and handling extra.

CENTRAL POINT

Circle 52 on reader service card

However, it can't prepare other key business documents, such as invoices or customer statements.

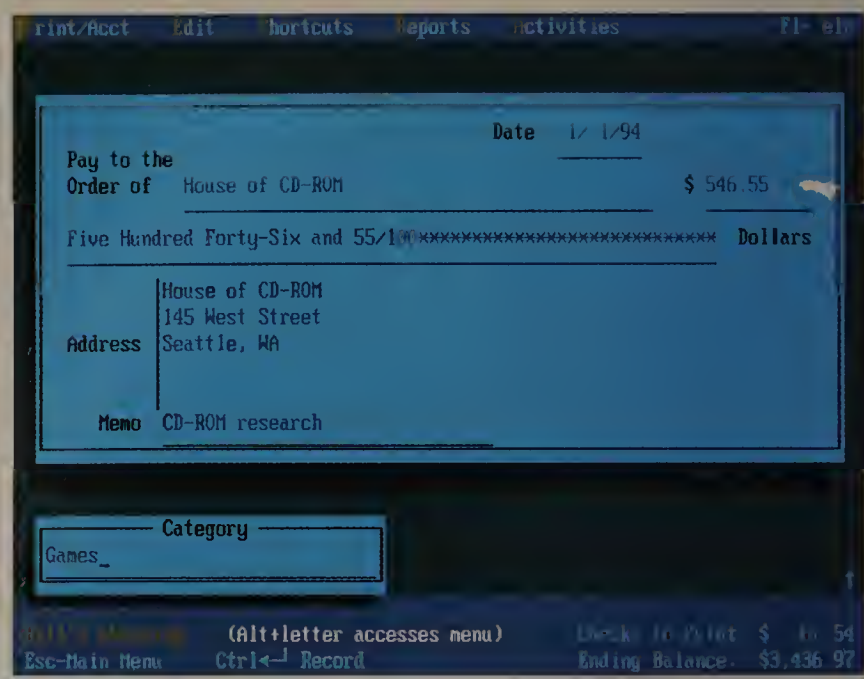
This program won't help you manage your personal financial assets, such as stocks and bonds, nor will it assist in planning your financial future. However, it does have a better-than-average income tax section, including a facsimile 1040 that links to the company's Tax at a Glance program.

To prepare a bill payment, you fill in the familiar check facsimile on screen. Unfortunately, for a deposit, a credit card payment, or any other transaction, you fill in a form that looks like a check, which I found somewhat disconcerting. You'd think a visually oriented package could be a bit more creative in its design of screen forms.

The biggest knock against MoneyCounts is its use of accounting terminology, such as "posting to an account." This is consistent with full-fledged business accounting software but will confuse many individuals who have no desire to bone up on accounting jargon.

If you're starting a home business, MoneyCounts could provide a nice way to track your financial records. However, a business of any size will soon outgrow its limited capabilities. It will quickly get tedious using your word processor to prepare invoices for your customers, for example, and this capability should be part of an accounting program. For personal use, it's suitable for paying your bills and estimating your income taxes, but it lacks the facility to manage your financial assets properly.

At $49, MoneyCounts is perfect for a very specific market: the small businessperson who pays a lot of expenses, doesn't prepare many sales invoices, and doesn't need to track assets. These circumstances may be common in budding businesses today, but they don't match the aims of most business owners. *Parsons Technology, 800/223-6925, 319/395-9626.* **Reader service no. 612**



SCREEN FORMS IN QUICKEN FOR DOS make preparing checks a snap.

Quicken for DOS 7.0

PROS: Almost-automatic bill payments, financial planning calculators help you reach savings goals

CONS: Doesn't provide financial advice

The newest incarnation of Quicken for DOS makes it easier than ever for you to pay your bills. You now have two different options for creating checks, for example, or you can even choose to avoid them altogether by paying merchants electronically.

Tracking expenses is easier with a new service that allows you to

A Consumer's Guide to Printed Checks

Personal finance software is cheap; it's the checks that can be expensive, and they must be compatible with your software. Most personal finance software packages include order forms so you can buy compatible check forms from an approved printer. The approved printers, however, don't always offer the best deals.

We priced a starter kit of forms that included 500 tractor-feed checks for dot matrix printers and 250 double-window envelopes, which is about a two-year supply. Prices ranged from $70.40 for WinCheck to $117.90 for Kiplinger's CA-Simply Money. The double-window envelopes display your preprinted name and address at the top; the merchant name and address fit in the lower, main window. (You probably won't need as many envelopes as checks because many merchants supply their own return envelopes, which you can use instead.)

If you need a duplicate of the check, an attached descriptive voucher stub, or sheet-fed checks for a laser printer, the check forms will most likely cost more.

Approved printers don't always offer the best deals on check forms. Shopping around can save you a considerable amount of money.

It pays to look into prices from other printers such as New England Business Service (800/999-9394); you may be able to find a better deal than the one that is offered through your personal finance package.

Your bank will accept virtually any computer check, but make sure check forms ordered from "nonapproved" printers are compatible with your software. Most programs don't allow you to adjust their check-printing templates to fit just any old check.

One notable exception is WinCheck, which allows you to customize on-screen check forms that print on any form. It's probably not coincidental that WinCheck offers the lowest price for a starter kit of check forms.

Since laser printers print only when a full page is complete, I recommend buying laser checks that come one to a sheet. Three-to-a-sheet laser checks allow you to print checks only in multiples of three, so if you use them, resign yourself to an incomplete number sequence in your check register when you destroy the odd-number check.

For today's best jobs, you need high-tech training...

Get the new skills you need for a high-paying career in computer programming!

Only NRI at-home training gives you real-world programming skills in *three* in-demand languages: QBasic, C, and Visual Basic, today's hot new language designed for writing popular Windows applications. Best of all, you get hands-on training with a powerful 486sx-based computer system, complete with Super VGA color monitor, 200 meg hard drive, Windows, and professional programming software you keep!

▶ NRI, the leader in at-home computer training, shows you how to take advantage of today's newest programming opportunities

Get in on the ground floor of computer programming, one of today's fastest-growing career fields. The Bureau of Labor Statistics forecasts that job opportunities for programmers will increase *much* faster than average over the next 10 years, with as many as 400,000 *new* jobs opening up by 2005.

And the fastest-growing segment of programming jobs will be PC programming, fueled by the phenomenal popularity of Windows and the rise of exciting new languages such as QBasic, C, and Visual Basic.

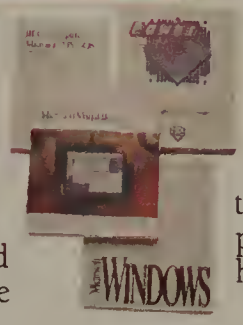
Now, with NRI at-home training, you can get the new skills you need to build a top-paying career — even a full- or part-time business of your own — in this high-growth, high-opportunity field.

▶ Get hands-on experience with today's programming tools: a powerful 486sx-based computer, Windows, Visual Basic, and more —all yours to keep!

Right from the start, NRI gets you actively involved in the challenge of real-world programming. Step by step, you learn to create the kinds of full-featured, powerful programs today's employers and clients demand... including programs designed for use in a Windows environment!

Only NRI gives you first-hand programming experience with a state-of-the-art, Intel-based 486sx computer system, complete with Super VGA color monitor, 200 meg hard disk drive, a full megabyte of RAM, 3.5 inch floppy drive, mouse, and more — all yours to train with and keep!

Plus you explore the extraordinary capabilities of *three* in-demand programming languages. You learn to design, code, run, debug, and document programs in QBASIC, C, and Visual Basic. Best of all, since Visual Basic is specifically designed for creating Windows applications, you learn to generate fully functioning Windows programs, complete with text boxes, command buttons, and other sophisticated graphical interface elements.



▶ No previous experience necessary

Train with NRI, and immediately start getting the money-making job skills you need to be a computer programmer — no matter what your previous background.

NRI's step-by-step lessons and hands-on programming projects help you first master the programming design concepts used every day by successful PC programmers. With your experienced NRI instructor on call and ready to help, you go on to learn programming in three of today's hottest languages.

By the time you complete your course, you have a clear understanding of programming methods, languages, and techniques...and you're ready to handle any programming task with confidence.

See other side for highlights of your NRI hands-on training in computer programming

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Learn computer programming as you train with the latest programming tools… a 486sx-based computer system, Windows, Visual Basic, and more!

"I couldn't believe NRI gives you a computer, loads of reference material, and professional software. The course has taken my knowledge of computers and my self-confidence to new levels!"

Rob A. Chappa, *NRI Student*

Here's what makes your 486sx mini-tower computer system the ideal programming tool:

- Full IBM PC/AT-compatibility
- High-speed Intel 80486sx CPU with 25 MHz clock
- 200 megabyte hard disk drive
- 1 meg RAM installed, plus 4 meg additional RAM; 64K ROM
- Windows graphical interface
- NEW! 14" Super VGA color monitor with tilt-swivel base
- High-density 3.5 inch floppy disk drive
- DOS operating system with QBasic interpreter
- Professional compilers for programming in C and Visual Basic

▶ Now, as never before, you can succeed as a computer programmer

NRI at-home training gives you everything you need to build a high-paying career as a computer programmer. Designed around a state-of-the-art 486sx computer system, your training guides you smoothly from fundamental principles through coding in three of today's most widely used computer languages: QBasic, C, and Visual Basic, the language designed exclusively for programming in a Windows environment.

With NRI, you get the hands-on experience and the confidence it takes to master today's programming challenges. And, by creating and running your own full-length programs, you build skills you'll be proud to show any prospective employer or client.

▶ Send today for your FREE catalog

Prepare now for a high-paying career as a computer programmer! See how NRI at-home training in Computer Programming gives you the experience and the know-how, the computer and the software you need to get a fast start in this top-growth field. Send today for your FREE catalog.

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Card 72

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receive detailed credit card statements via modem or disk.

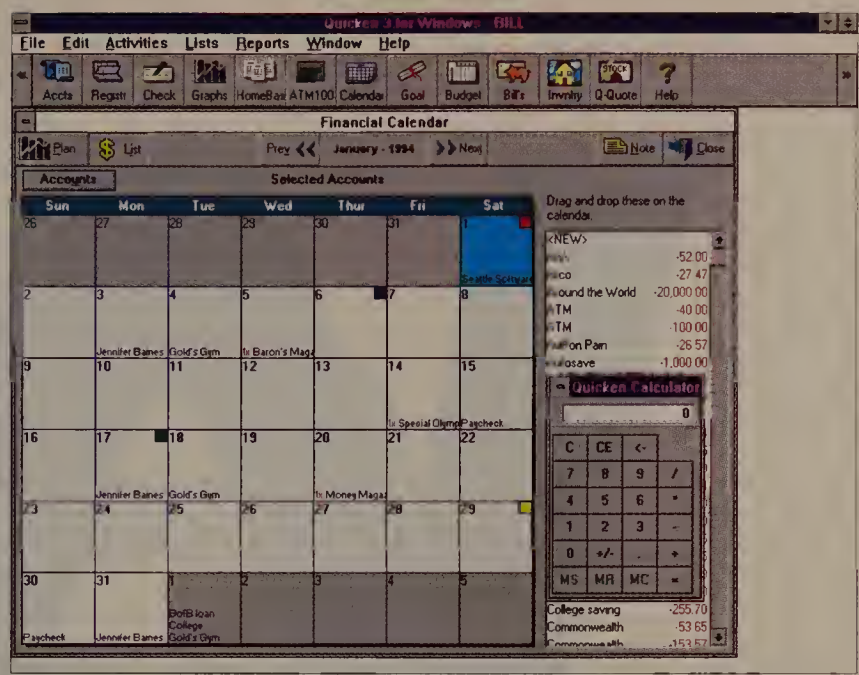
Quicken makes it so easy to pay your bills, track your expenses, budget your income, and graph the results that it earned a Best Buy for checkbook management.

A key new feature is a financial calendar that lets you schedule bill payments. You can select from among the bills you pay regularly, assign them to specific dates, and pay them at intervals. Quicken gives you the option of creating the check entry automatically or just reminding you when the payment is due.

The financial planning calculators and portfolio management enhancements in the latest release make it easier to manage your financial assets. However, Quicken still lacks the asset management depth of Managing Your Money. For example, Quicken won't perform a detailed analysis of a rental property to calculate its projected rate of return.

Quicken lets you select from seven portfolio views showing your holdings; investment performance, including percentage ROI (return on investment); current valuation; and latest pricing changes. The program has five financial planners you can use for calculating loans, savings goals, a college education fund, a retirement nest egg, and for refinancing existing obligations. Each planner is flexible. For example, the loan planner calculates either the payment for a given loan or determines the principal amount of the loan you can afford with a stated periodic payment. This lets you see how large a mortgage you can take out if you can afford to pay $1500 a month, for instance.

Quicken's already good online help has been improved. Qcards offer automatic online help if you linger too long without acting, and Coaches offer shortcut tips. You also have a comprehensive tutorial for learning the program and the usual context-sensitive online help. If you're still firmly wedded to DOS computing, this bill-paying program is as good as it gets. Otherwise, you might want to consider switching to the even more capable Windows version. *Intuit, 800/624-8742, 415/322-0573.*



QUICKEN FOR WINDOWS' NEW FINANCIAL CALENDAR lets you drag previous payment items and drop them on their scheduled due dates.

Quicken for Windows 3.0

PROS: Almost-automatic bill payments, financial calendar shows future payments at a glance

CONS: Doesn't provide financial advice

WINDOWS Quicken for Windows is a Best Buy for managing your checkbook and for tracking the basic flow of your money. Like the DOS version of the program, Quicken for Windows makes it easy to pay your bills and track expenses according to your budget. But the Windows version offers more features and is easier to use.

Even with its improved portfolio management capabilities, however, Quicken falls a little short of the high standard for managing your financial assets established by Manag- **continued on page 218**

Money on the Wire

Want to pay without paper? Most of the packages we reviewed (except for MoneyCounts and WinCheck) offer electronic bill-paying through BillPay USA, a service on Prodigy, or CheckFree. These services let you pay your bills electronically.

To use CheckFree, for example, you simply enter payments into Quicken or Managing Your Money as usual; the software then creates payment information and sends it via your modem to the CheckFree processing center. A few days before the payment due date, the service charges your bank account automatically and transfers the funds to the supplier.

CheckFree pays some merchants electronically using the Federal Reserve network, the same network banks use to transfer funds. Merchants who don't accept electronic transactions are paid with a laser-printed check, prepared and mailed by CheckFree.

A subscription to the CheckFree service costs $9.95 per month and covers up to 20 payments. Additional payments cost $3.50 for each block of ten. BillPay USA, which you can use with Simply Money, Managing Your Money, and Microsoft Money, costs $9.95 for 30 payments; extra payments are $3.50 per block of ten. The first month is free. To access BillPay, you also have to pay $14.95 a month to connect to Prodigy.

Considering what you'll save in postage, check forms, and envelopes, either BillPay or CheckFree is a sweet deal. But make sure the merchants you buy from regularly are equipped to accept electronic payments. If they aren't, they'll still receive your payment by check, but the service may not be worth setting up.

The paperless office is a step closer with new services that allow you to pay your bills electronically via personal finance software.

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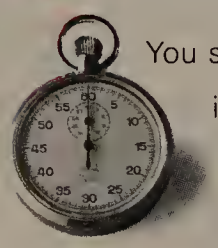
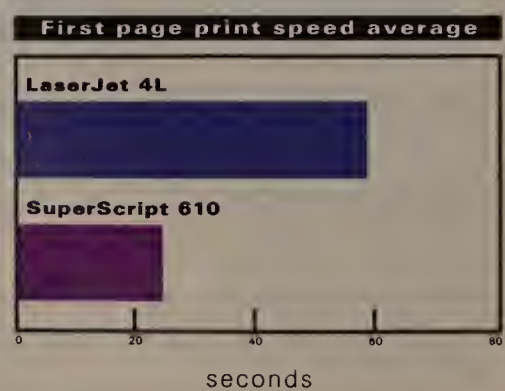
If you have to wait much longer to print, you need



You see, the NEC Silentwriter SuperScript 610 is the only laser printer that begins printing the second you press "Print." So you don't have to wait. And the only laser printer with a first page print speed that's three times faster than the HP® LaserJet® 4L.

The first Windows™ printer.

In fact, the SuperScript 610 is a whole new way of printing. It's the first personal laser printer that gets its processing power directly from Windows and your PC. That means it's as upgradable as your PC. So as your PC gets faster, so does your printer. In fact, this printer prints exactly what you see on your screen. Fonts, DOS applications, everything. And at less than $700 it's an even better value than you thought.



Based on 486 66 MHz PC with 8MB RAM. Average speed based on printing one-page documents from word processing, spreadsheet, presentation and graphics applications. The Energy Star emblem does not represent EPA endorsement of any product or service.
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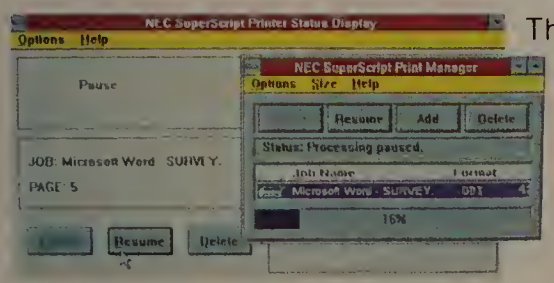
a Silentwriter® SuperScript™ 610.

See what's happening, while it's happening.



The SuperScript 610 even sends an on-screen status display to your PC that tells you exactly what's going on. So screaming, cursing and kicking your printer are no longer necessary.

And it comes with a 2-year replacement warranty. So, if by some remote chance your Silentwriter 610 runs into bigger problems than an empty paper tray, have no fear.

We'll get you a new one overnight. If you can wait that long.

For more information on this exciting new technology, call 1-800-NEC-INFO. Or via fax, call NEC FastFacts™ at 1-800-366-0476. Request document #SW610.

NEC

Circle 205 on reader service card

Two w
make a

If patience is a virtue, it would be tough to find anyone more virtuous than a 386 user.

Of course, you're not waiting to be canonized. You just want to get your spreadsheet crunched, printed and e-mailed before your boss's boss calls you looking for it.

Now if you had a 486, you wouldn't have this problem. But all that wishful thinking goes out the window when you consider the double-knots on your company's purse strings.

Performance Benchmarks		
(figures indicate relative performance)	Intel i386	Cyrix 486 Upgrade
MS Excel 3.0	1.0x	2.1x
MS Word 2.0	1.0x	2.8x
Micrografx Designer 3.1	1.0x	2.6x
Benchmark tests run on IBM PS/2 Model 70/20MHz.		

The new Cyrix 386-to-486 Upgrade Microprocessor delivers application performance that's twice as fast. And that's twice as smart.

Fortunately, there's a smarter alternative to the downward migration path pictured above. It's called the 386-to-486 Upgrade Microprocessor.™ And it's only available from Cyrix,® the smarter microprocessor company.

It's smarter because it's the only single-chip upgrade solution of its kind. And as such, the most cost-conscious way to replace the pedestrian 386 computer you have, with the searing 486 power you want.

Our upgrade chip acts just like a 486, and with good reason. It has Clock Doubling, a 1K on-chip cache

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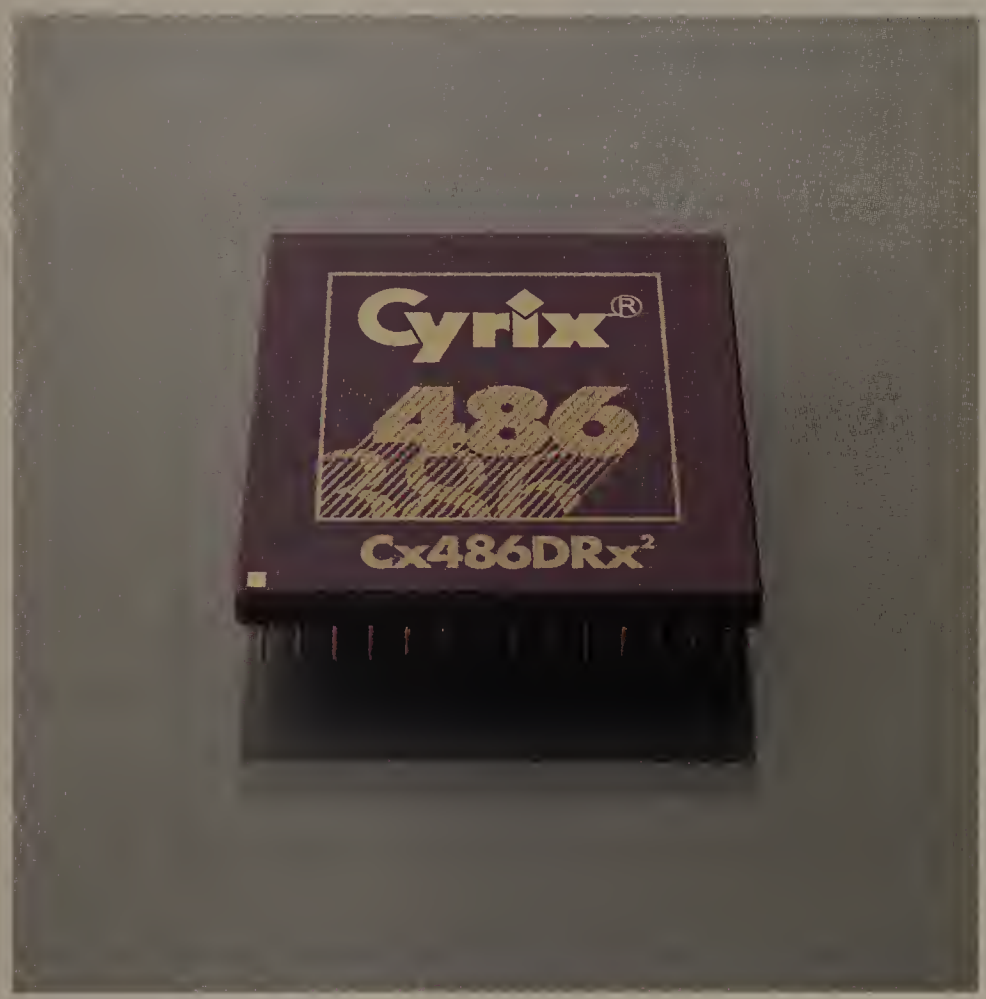
ays to 386 fly.

Now available for 386SX models!



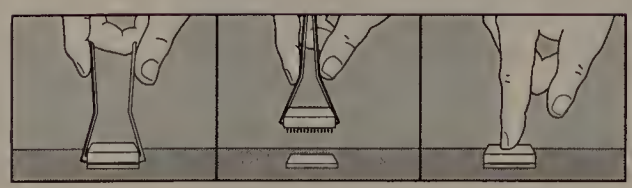
and enhanced Cx486 technology. Which means it delivers *twice* the application performance, and 100 percent compatibility with all your software.

MICROSOFT WINDOWS COMPATIBLE

yes It runs with NetWare

Like DOS, Windows and OS/2. Even Windows NT. It's also certified software compatible in Novell, Banyan and Lan Manager nodes.

What's more, it's easy to install (it takes all of 15 minutes), and costs under $400. So it's also easy to justify to even the stingiest bean counters.



Here's how to get an instant 486. Just use the chip removal tool provided to pull out your 386DX chip (16, 20, and 25 MHz versions), and plug our Cyrix Upgrade Microprocessor into the empty socket. Installing the SX version is even easier. It just clips on over the existing chip.

Every Cyrix upgrade chip comes with the reassurance of a limited lifetime warranty, toll-free telephone support, and a money-back guarantee.

So do the smart thing. Call any dealer. If they don't have it, they can order it. Or call us directly at 1-800-46-CYRIX for the dealer nearest you.

Cyrix® instead™

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Circle 92 on reader service card

ing Your Money. For example, it can't update securities prices automatically by calling up an online data service at prespecified intervals. Furthermore, while it can calculate your net worth, Quicken (unlike Managing Your Money and Simply Money) lacks the ability to advise you on how to maximize your financial assets.

Like its DOS counterpart, Quicken for Windows includes a new financial calculator that makes it easier than ever to pay bills. In the Windows version you can select a previous transaction with your mouse and drag it onto the calendar, then drop it on the payment day. When you specify the frequency of payment, Quicken projects future payments as far ahead as you need.

The calendar in the Windows version displays details down to the name of the payee on each date. It also allows you to color-code days for special events, adding a red-letter day for a birthday or a queasy green day for a medical appointment. Unfortunately, Quicken's calendar can't be printed.

FEATURES COMPARISON

Personal Finance Packages: Not Created Equal

● Yes
○ No

	Kiplinger's CA-Simply Money 3.1	BEST BUY Managing Your Money 10.0	Microsoft Money 2.0	MoneyCounts for Windows 1.0a	BEST BUY Quicken for DOS 7.0	BEST BUY Quicken for Windows 3.0	WinCheck 3.0p
Standard features							
List price	$69.99	$79.95	$69.95	$49	$69.95	$69.95	$39.95
Operating environment	Windows	DOS	Windows	Windows	DOS	Windows	Windows
Disk space required (MB)[1]	4.5	5	2	3.5	2.5	5	1
Number of initial setups	3	0	3	5	3	3	1
Calendar	●	●	○	○	●	●	○
Calculator	●	●	●	○	●	●	●
Checkbook management							
Memorizes regular payments	●	●	●	●	●	●	●
Splits categories	●	●	●	●	●	●	●
Budgets	●	●	●	●	●	●	●
Reconciles bank account against statement	●	●	●	●	●	●	●
Cost of check starter forms[2]	$117.90	$101.85	$99.90	$91.05	$86.90	$86.90	$70.40
Customizes check printouts	○	●	○	○	○	○	●
Electronic payment interface	●	●	●	○	●	●	○
Tracks credit card expenses	●	●	●	●	●	●	●
Credit card interface	○	○	○	○	●	●	○
Income tax							
Tax categories	●	●	●	●	●	●	●
Interface to tax software	●	●	●	●	●	●	○
Reporting							
Compares actual to budgeted expenses	●	●	●	●	●	●	●
Compares this year to last	○	●	●	●	●	●	○
Customizes reports	●	●	●	●	●	●	●
Generates business financial reports[3]	○	○[4]	○	●	○	○	○
Loan amortization	●	●	●	●	●	●	○
Portfolio management							
Displays securities price history	●	●	○	○	●	●	○
Imports securities prices	●	●	○	○	●	●	○
Measures return on investment	●	●	○	○	●	●	○
Measures investment yields	●	●	○	○	●	●	○
Financial planning							
Provides financial advice	●	●	○	○	○	○	○
Estimates future cash flow	○	●	○	○	●	●	○
Estimates future net worth	○	●	○	○	○	●	○
Estimates retirement income	●	●	○	○	●	●	○

[1] Rounded up to the nearest ½MB.
[2] Includes 500 standard-size voucherless checks, 250 double-window envelopes, and shipping and handling charges.
[3] For double-entry bookkeeping including trial balance.
[4] Prints invoices and tracks accounts receivable.

Quicken for Windows offers a useful financial planning graph that isn't duplicated in any other program, not even its DOS sibling. This takes into account recurring payments and projected income and shows the ups and downs of your cash balances for up to two years at a glance. The planning graph clearly shows when your projected account balance falls into an overdraft. Then it's time for you to arrange a bank loan—or head for the border. On the brighter side, you'll also be able to see if you'll have enough cash to afford that fancy new projection TV set by summer or to take that vacation you've been dreaming of.

Although both Quicken programs provide similar capabilities, the Windows version has a slight edge when it comes to financial capabilities. For example, the portfolio manager offers 18 different measures of investment performance in the Windows version, compared with 14 in the DOS software.

The Windows version also allows you to customize the scrolling icon bar to include one-click access to frequently used reports and functions. There are more than 40 icons you can select from to represent as many as 25 different actions. And custom reports are easier to create since Quicken for Windows lists many check-off options on one screen.

So which version of Quicken should you buy? Both packages cost $69.95, but the added capabilities and easier custom reporting of the Windows version make it the better choice—assuming, of course, you have at least a 386-based machine. *Intuit, 800/624-8742, 415/322-0573.*

WinCheck 3.0p

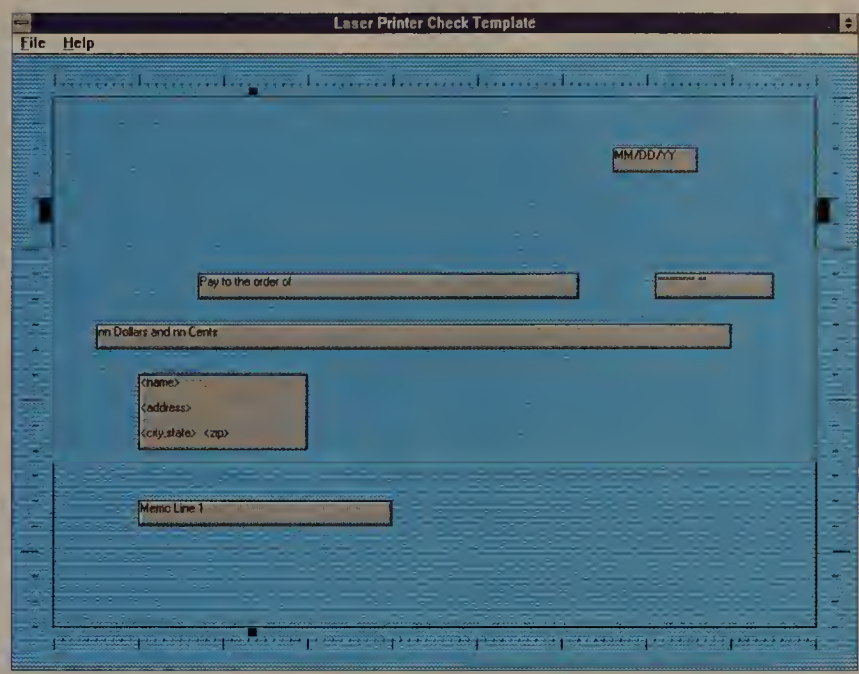
PROS: Easy to use, includes custom check-form designer
CONS: Lacks financial features

WINDOWS WinCheck is a plain-vanilla checkbook manager, the bargain of the personal finance software lot at a list price of just $39.95. The program handles the basics of creating checks and tracking expenses, but it does little else.

Don't look to this package for any help in planning your finances or for assistance in managing your portfolio of stocks, bonds, and so on. It doesn't even include any financial graphs, which is unusual for a Windows-based program. Still, its elegant simplicity means you won't need to fight your way through complicated menus. WinCheck is the most straightforward and the easiest to learn of the personal finance programs we looked at in this review.

WinCheck's check register displays the transactions for just one month, defaulting to the current month. You can also view transactions from prior months if you like, but you have to retrieve them one month at a time.

Even though it's limited to displaying a single month, WinCheck's check register view gives you a fairly complete picture of your cash assets. It shows you the running cash balances calculated by the program for both checking and savings accounts as well as the balances recorded on your bank statements for both accounts.



WINCHECK ALLOWS YOU TO CUSTOMIZE YOUR own checks. The program's forms-design capability makes it compatible with just about any preprinted check form.

It's easier to record transfers between savings and checking accounts in WinCheck than it is in most other personal finance programs. All it requires is a simple menu command: Just click and transfer the funds. (Now if only dealing with financial institutions could be that painless.)

Surprisingly, WinCheck comes with an easy-to-use forms designer. This allows you to drag and drop elements such as payee name, amount, and date anywhere on a check. Managing Your Money is the only other program that lets you modify check layouts, but its character-based orientation makes it rather difficult to visualize what you're changing.

This forms-design capability should make WinCheck compatible with most check forms. It's no surprise that Wilson Window Ware also charges less for checks than any other company.

If what you're looking for is an inexpensive, no-frills check-writing package, WinCheck is the ticket. *Wilson Window Ware, 800/762-8383, 206/938-1740.* **Reader service no. 615**

Stop! Don't Type in Those Expenses

Got a lot of credit card transactions you want to track? Then take a look at IntelliCharge, a Visa credit card offered by Quicken. With this card you receive your monthly statements on floppy disk or via your modem. Quicken reads the statement data, then categorizes the expenses according to your preset preferences. This saves you the tedium of having to enter and categorize the expenses manually every month.

There's no charge for the credit card, and the first six months of electronic statement delivery is free. After the six-month period is up, it costs $3 per month for modem delivery and $4.50 per month for floppy disk, which is billed annually.

If you have a lot of credit card transactions, IntelliCharge could prove worthwhile. Unfortunately, the credit card is available only for Visa from Primerica Bank. But other software developers are working on electronic statements that will be available from many different banks and credit card issuers.

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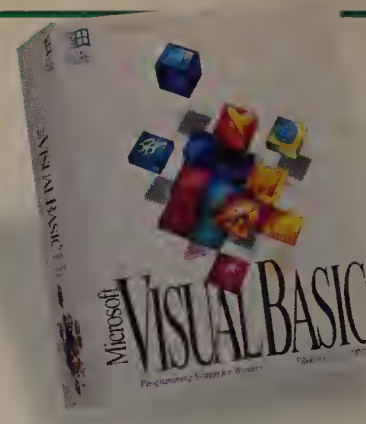

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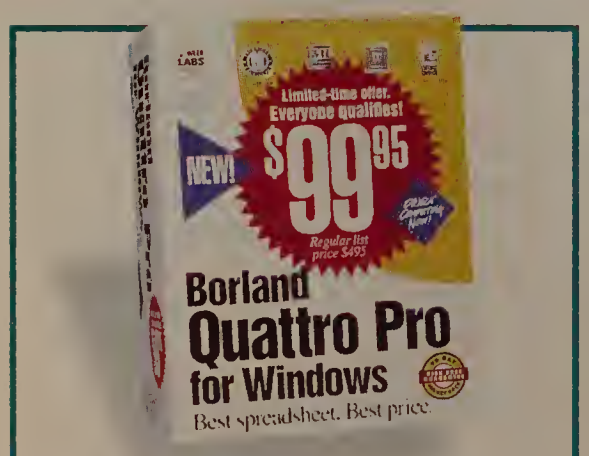

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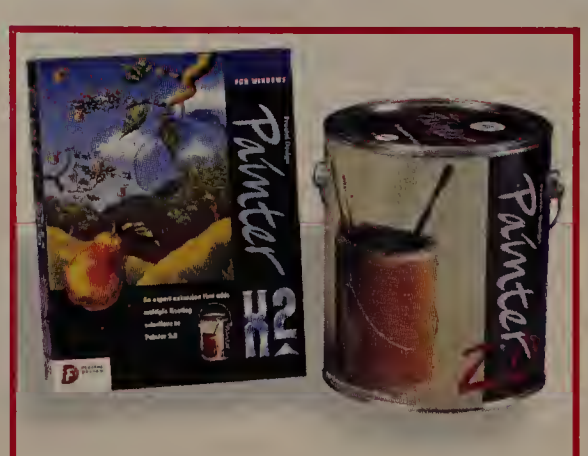

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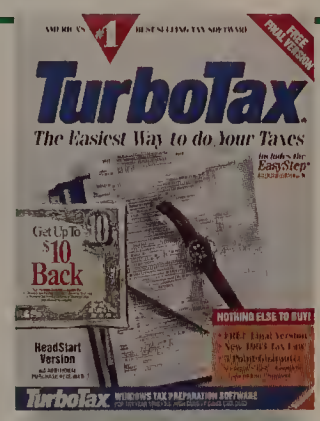

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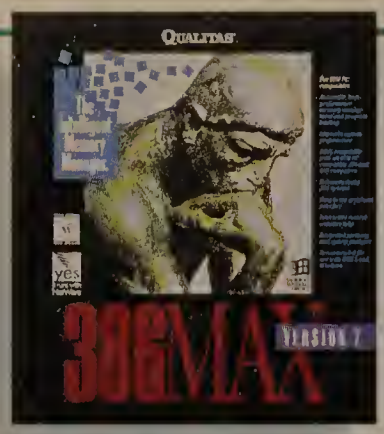

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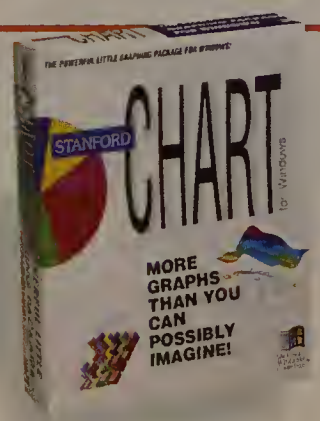

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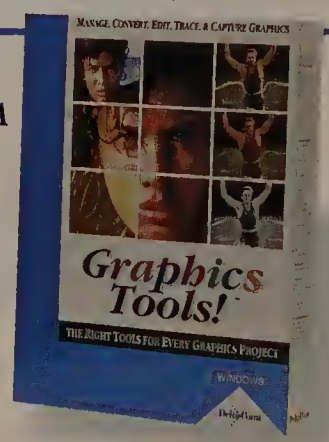

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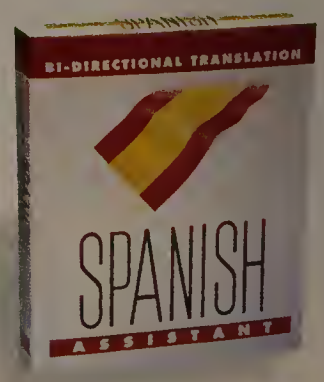

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Here's How

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HELP LINE Q & A

Tip of the Month

DISABLING CALL WAITING: If you have call waiting service on your phone line, you'll want to disable it before making a call with your modem or fax-modem. Call waiting's beeps can disrupt a fax or modem session and even cause a disconnection.

Most local phone systems let you enter a code—often *71 or *70—to disable call waiting prior to a call. Contact your local company to learn the right code. Add the code to your modem's dialing string in your communication software's modem setup screen so the string begins ATDT*70. After your modem or fax-modem hangs up, call waiting will be reactivated.

If your local phone system doesn't offer a way to disable call waiting temporarily, you'll need to tell your modem to tolerate call waiting's beeps and not to hang up in the middle of a telecommunications session or fax transmission. You'll want to increase the value of its S10 memory register, which sets how long, in tenths of a second, the modem will wait after the loss of the carrier before hanging up. Try adding S10=55 to your modem's initialization string, which is also in your communication software's modem setup screen.

Judy Heim, Contributing Editor

Legal Noise

Q I bought a Pro AudioSpectrum 16 sound card a few days ago, but when I try to use it with almost any of my DOS-based applications, my system locks up. I tried using my 386-33 to play music, sound effects, and voice through the board, and the system halted immediately. Please help.
Geoff12P via America Online

A Your problem has two possible sources: one technical, one legal. First, the technical issues: The Pro AudioSpectrum 16 sound board causes conflicts when installed in many PCs because it takes up two DMA channels, two interrupts, and two blocks of I/O port addresses. (It uses a third interrupt and another port address block if you want it to emulate the Roland MPU-401 MIDI interface.) If other components try to use any of these system resources simultaneously, the system could lock up. In the answer to the next question, I'll describe a product that might help.

Your problems may also be due, at least in part, to a glitch that caused a lawsuit between Creative Labs and Media Vision (the company that made your Pro AudioSpectrum). About two years ago Creative Labs gave software developers a kit intended to help them produce programs that work with the SoundBlaster sound card. Media Vision later filed suit, claiming that the software in the kit *intentionally* crashed users' systems if the board was a SoundBlaster compatible such as the Media Vision board. The lawsuit was settled out of court, so no one knows what the parties agreed to—however, one would hope that later versions of the developers' kit do not have this problem. If you can't find a resource conflict in your PC, and SoundBlaster software crashes on your Media Vision board, call the software vendor and ask for a version that's known to work with your board.

Configuration Conundrum

Q My 486DX-50 has a hard drive, two floppy drives, a CD ROM drive, a sound card, VESA local bus video, and a fax-modem. With all of this hardware, I can't keep track of the DMA and IRQ assignments. What is an easy way to list which DMA and IRQ settings are assigned to a particular board? Is there a standard list of which type of boards should have a particular setting?
Enzo H20 via America Online

A Some software products claim to be able to sniff out which resources are claimed by which peripherals, but I have yet to see one that can identify peripherals such as CD ROM drives and fax-modems. Network installers, who need to maintain multiple systems, use a hardware product such as The Discovery Card. Made by AllMicro of Clearwater, Florida, this card turns on a light each time a DMA channel or interrupt request line is used. Such a card may be able to find out what's going on inside your system. It won't catch I/O port conflicts, so for those you'll still have to keep a list (I use a spreadsheet for this purpose).

If you want to know the standard ports used by AT-compatible peripherals (including those on the motherboard), one of the best books to get is Thom Hogan's *PC Sourcebook*. It contains a wealth of information about

ILLUSTRATIONS: DAVID TILLINGHAST

every aspect of the de facto PC "standard" and will help you pinpoint the resources used by most peripherals.

- **The Discovery Card** $249; AllMicro Inc.; 800/653-4933, 813/446-6660
  Reader service no. 660
- **PC Sourcebook** (ISBN 1-55615-321-X) $39.95; Microsoft Press; 800/677-7377

Mixing Memory

Q I just purchased 4MB of 80ns RAM, but my PC came with 70ns chips. I have not experienced any problems yet. Do you know of any problems that might be lurking over the horizon?
Mr Rodsky via America Online

A Return that memory if you can. You're taking a big chance using memory that's slower than what came with your PC. Since PC clone vendors have such low profit margins, they count every penny. They usually use a particular speed of memory chips because they couldn't get away with using cheaper, slower ones.

In general, it's best to match the speed of the memory already in your system as closely as possible. Believe it or not, adding memory that's significantly *faster* than what came with your machine can also cause problems. This is because faster chips don't just *get* data faster—they also take it away faster at the end of a memory cycle. If the motherboard is expecting a longer hold time, you could wind up with an unreliable system. My motherboard, for instance, will work with 80ns SIMMs but not with 60ns. That's fine with me; it saves me money.

BASIC on the Blink

Q When I run a QBASIC program in DOS 5.0, the text editor screen appears with the name of the BASIC program I am running. The command I use is QBASIC /RUN C:*filename*. Is there a way of running the BASIC program without the annoying text editor screen appearing?
Thomas M. Jones, Derry, Pennsylvania

A The QBASIC interpreter, which comes free with DOS, wasn't designed to look professional or replace commercial compilers. If you need professional-looking code, I recommend that you consider Bob Zale's PowerBASIC (which used to be Borland's Turbo BASIC). The company will even give you a special discount price if you're upgrading from any other BASIC, including QuickBASIC.

- **PowerBASIC 3.0** $149 (competitive upgrade, including QuickBASIC, $99); PowerBASIC Inc.; 800/780-7707, 510/516-7700
  Reader service no. 661

Now You Need It, Now You Don't

Q I once read that the file WINA20-.386 had to be in your hard drive's root directory if you wanted to run Windows—unless you specified another location where Windows could find it. Not being particularly observant, I only recently noticed that I had deleted this file from my disk and that no other copy was anywhere on the disk. Yet I have been running Windows just fine without it!

To be on the safe side, I dug out my DOS 5.0 disks and expanded WINA20-.386 back into my root directory. Does Windows 3.1 need this file or not?
Ron Wickert, Virginia Beach, Virginia

A WINA20.386 was designed to make DOS 5.0 (and later versions of DOS) work with Windows 3.0. It's a VxD (32-bit virtual device driver) that goes in and patches large chunks of Windows 3.0 to fix memory management and compatibility problems. WINA20.386 isn't necessary if you're running Windows 3.1, but some memory managers and drivers check for its presence. It's therefore a good idea to keep it in the root directory to avoid problems.

Which Way Does the Wind Blow?

Q All modern PCs seem to be ventilated by a blower that pulls air out of the case through the power supply. This blower causes air to enter through

USER GROUP OF THE MONTH

ACGNJ

The January user group tips are supplied by the Amateur Computer Group of New Jersey. ACGNJ holds monthly meetings in Scotch Plains, New Jersey. The group publishes a monthly newsletter featuring hardware and software reviews, tips, industry insights, and a list of support volunteers. The organization sponsors the annual Trenton Computer Festival and maintains an electronic BBS with 500MB of shareware and public-domain software. ACGNJ includes special interest groups for 1-2-3 users, Visual Basic and C programmers, new users, people interested in genealogy, and others.

For more information, contact Bill Farrell, membership chair, at P.O. Box 135, Scotch Plains, NJ 07076, or call 908/572-3481. ACGNJ's BBS is available by calling 908/752-9285 (14.4 kbps) or 908/752-9388 (2400 bps). Membership costs $20 per year for individuals, $25 for families, and $15 for students and seniors.

Reader service no. 662

MAKING YOUR KEYBOARD BEHAVE: Are you having problems with <Caps Lock>, <Num Lock>, <Shift>, <Alt>, or <Ctrl>—for example, Caps Lock won't engage or Num Lock won't release—and using DOS 5.0 or later? Some programs conflict with the ROM BIOS keyboard handler, which tells the processor which keys have been pressed. Add the command C:\DOS\KEYB US,,C:\DOS\KEYBOARD.SYS to your AUTOEXEC.BAT. KEYB.COM replaces the keyboard handler with its own routine and doesn't have these conflicts.

Bob Todd
Amateur Computer Group of New Jersey

the various openings in the case—including the slots of the floppy and CD ROM drives. This air brings with it all the dust and dirt in the surrounding air and eventually makes your disk drives filthy. Wouldn't it be simple to reverse the direction of the blower so that the case would be pressurized, and filter the incoming air with some sort of a quick-change filter? Is a modification kit for this purpose available?
John F. Brunfield, Lynnville, Tennessee

A The makers of some of the best CP/M computers once advertised positive ventilation through the floppy disk drives. However, when IBM came out with the original PC—which was the standard for everything else—it chose the ventilation scheme that's used in all PCs today. I suspect IBM made its design decision because it was concerned that a filter could become clogged, causing the PC to overheat.

Reversing a PC's ventilation would require nonstandard parts—and since the commodity parts in today's PCs enjoy tremendous economies of scale, a machine with a different ventilation system could be much more expensive.

You Must Be Fast to Go Faster

Q I am interested in the chips Cyrix offers as upgrades or replacements for 386DX PCs. My 386DX-16 is slow by today's standards, but its 10MB of RAM, excellent hard drive, and decent video card make it a good system.

Will a Cyrix chip speed up my PC? Will it work with my math coprocessor? Or should I spend more money and buy a 486DX-25 or 486DX-33?
Patrick Buchanan,
North Richland Hills, Texas

A Yes, Cyrix's upgrade chips for 386 PCs certainly make them run faster. But your motherboard is limited to 16 MHz, so any CPU upgrade you install will be stuck at that speed, even though it's capable of replacing a 386-25. I recommend either upgrading the motherboard to a 486-33 or 486-66 or buying a new system and finding another use for your older one. Today's systems have so much bang for the buck that your money may be better spent on new hardware than on upgrading what already works.

Double Shuffle

Q If DOS 6.0 or 6.2 is installed with the DoubleSpace compression turned on, will I still be able to copy files onto a floppy and use them on another computer that has DOS 5.0?
J. A. Shepard, Cleveland

A If the floppy is not compressed with DoubleSpace (you have to do this intentionally), data written to it will be uncompressed and can be read by any DOS system. However, if you want to create compressed floppies that are readable by any system regardless of which version of DOS it runs, you can do it with a third-party utility. Vertisoft's SpaceManager and AddStor's DoubleTools give a DOS 6.0 system the capability to produce compressed floppies that can be read by any system (when you make the disk, the compression program comes along for the ride). And all the major brands of compression software other than DoubleSpace (including Stacker, SuperStor, and XtraDrive) have this capability built-in.

- **DoubleTools for DoubleSpace 1.0** $99, **SuperStor Pro 3.0** $149; AddStor Inc.; 800/732-3133, 415/688-0470
  Reader service no. 663
- **SpaceManager 1.5** $89.95; Vertisoft Systems; 800/466-5875
  Reader service no. 698
- **Stacker 3.1** $149 (competitive upgrade for DOS 6.0 $79.95); Stac Electronics; 800/522-7822, 619/431-7474
  Reader service no. 699
- **XtraDrive 3.0** $79.95; Integrated Information Technology Inc.; 800/832-0770, 408/727-1885
  Reader service no. 665

Power Windows

Q I often use two or three Windows programs together. I have to start one program and then get Program Manager to the top and start the other one. Is there an easier way? And can I make programs like Notepad start in the same place every time?
Luke Gedon, Amory, Mississippi

A If you simply want the applications to open every time you start Windows, the answer is simple: Hold down the **<Ctrl>** key and drag their icons to Program Manager's StartUp program group. Each application in that group will automatically be launched when Windows starts. But if you want to preserve the *arrangement* of your programs, you'll need a third-party utility. One of the best for this purpose is XSoft's Rooms for Windows, which can set up several arrangements of applications and switch between them.

- **Rooms for Windows** $59; XSoft; 800/428-2995
  Reader service no. 667

Adding a Second Hard Drive

Q I am considering buying another hard drive for my system. The current drive is a 120MB IDE Western Digital. I have found a used (two-month-old) 212MB IDE Seagate for sale. Will the two work together? If so, how should they be configured?
BOBLANE via America Online

A It depends on the drives. Before the industry developed a standard for IDE, different vendors' drives would not always work together on the same cable. And many vendors, as they gradually brought their products into compliance with the standard, did so without changing model numbers. This makes it almost impossible to tell if two drives will work together without actually testing them. Your best bet is to get a money-back guarantee on the new drive, then try it out.

To get correct jumper settings for the drives, call Seagate's tech support at 408/438-8222. It also has a BBS at 408/438-8771 and a 24-hour fax service at 408/438-2620. Western Digital's tech support is at 714/932-4900, and its BBS is at 714/753-1234. Unlike most disk drive companies, WD does not have a fax service, at least at this writing.

By Brett Glass

Brett Glass is a contributing editor for PC World. Help Line *welcomes your questions. See page 12 for contact information.*

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SPREADSHEETS Q & A

Loans in Any Spreadsheet

Q I have a monthly payment schedule for a loan that shows the amount due, the amount paid toward interest, and the amount paid toward principal. Some months I can pay extra toward the principal, but other months I can't. My understanding is that the amount of interest I pay should decrease when I make extra payments. How can I set up my spreadsheet to show the changes?
Dorothy Parrill, Northfield, Massachusetts

A Take a look at **FIGURE 1**. I've set up this example in Excel, but it will work in any spreadsheet. The data entry cells, containing the principal, interest rate, and term of the loan are shown in B3:B5; the formulas in D3:D5 give the required payment and the nominal cost of the loan if you paid the required amount each time. The table beginning at A8 contains the history of payments, the principal and interest amount of each payment, the principal remaining after each payment, and the cumulative interest paid.

To set up the model, start by entering the labels and values shown in A3:C5 and in A7:F7. Format cell B4 for percent, cells B8:F17 for two decimal places, and cells B3 and D3:D5 for currency. Enter the payment numbers and amounts shown in the payment schedule in A8:B19. Then enter the following formulas:

D3: **@PMT(B3,B4/12,B5*12)** If you're using Excel: **=PMT(B4/12,B5*12,-B3)**
D4: **+D3*B5*12**
D5: **+D4-B3**
C8: **+B8-D8**
D8: **+B4/12*B3**
E8: **+B3-C8**
F8: **+D8**
C9: **+B9-D9**
D9: **+B4/12*E8*(E8>0)**
E9: **+E8-(C9*(B9>0))**
F9 **+D9+F8**

Finally, copy the formulas in cells C9:F9 into C10:F19 to complete the schedule of payments for a 12-month loan. Copies of this worksheet, in Excel and 1-2-3 form, are available on PC World Online.

If the numbers on your worksheet agree with Figure 1, you've entered the formulas correctly. (In 1-2-3, don't worry if some of the zeros near the bottom of the worksheet appear as negative zeros; see "1-2-3 in the Round" in December 1993 for an explanation.) To apply this to an actual loan, reenter your own numbers in B3:B5, and copy the formulas in C8:F19 into as many additional rows as the length of your loan requires. Then enter your own payments in column B from row 8 down; you will probably want to enter the amount after every payment.

Here's how the formulas work. The required payment formula in D3 uses the PMT function to calculate a loan payment. It yields the amount necessary to pay off a loan given the principal (B3), the number of payments (B5*12), and the interest rate per payment (B4/12). The estimated total payments in D4 is the total of all your payments if you paid just the required amount each time; it includes all interest and principal. The estimated total interest (D5) is simply that amount minus the original principal.

In the payment schedule, the interest portion of the first payment (cell D8) is the interest rate for one month (B4/12) multiplied by the original principal. Thus the principal portion of the first payment (in cell C8) is the amount of the first payment (B8) less that interest portion. The principal remaining after the first payment (E8) is the original principal minus the principal portion of the first payment (B3 minus C8). This number becomes the basis for the interest calculation for the second payment (D9). This formula includes a logical expression (E8>0), which reduces the interest amount to zero after the loan has been paid off, as shown in cells D18 and D19. The remaining principal formula in E9 reduces the previous principal amount by the principal portion of the current payment, but only after a payment has been entered (the logical expression B9>0 sees to that). The cumulative interest column merely adds the interest portion of the current payment to the cumulative interest from the previous payment.

AMORT.XLS

AMORTIZATION SCHEDULE

Loan Principal:	$20,000.00	*Required Pmt:*	$1,749.03
Interest Rate:	9.000%	*Est. Total Pmts.:*	$20,988.35
Term (years):	1	*Est. Total Int.:*	$988.35

Payment Number	*Payment Amount*	*Principal*	*Interest*	*Remaining Principal*	*Cumulative Interest*
1	1,749.03	1,599.03	150.00	18,400.97	150.00
2	1,749.03	1,611.02	138.01	16,789.95	288.01
3	1,749.03	1,623.10	125.92	15,166.84	413.93
4	1,749.03	1,635.28	113.75	13,531.57	527.68
5	2,500.00	2,398.51	101.49	11,133.05	629.17
6	2,500.00	2,416.50	83.50	8,716.55	712.67
7	2,500.00	2,434.63	65.37	6,281.92	778.04
8	2,000.00	1,952.89	47.11	4,329.04	825.16
9	2,000.00	1,967.53	32.47	2,361.51	857.62
10	2,379.22	2,361.51	17.71	0.00	875.34
11		0.00	0.00	0.00	875.34
12		0.00	0.00	0.00	875.34

FIGURE 1: USE THIS WORKSHEET to calculate variable real estate principal and interest amounts.

Skipping Over Nothing in Quattro or 1-2-3

Q I have an inventory spreadsheet template in Quattro Pro 4.0 that contains information about 180 products. I fill in the quantities and the cost, and the spreadsheet calculates the selling prices. When I print the sheet, I want it to skip the rows where the quantity is zero. How can I do this without deleting all the zero rows manually?
Gary Webster, Woodstock, Georgia

A One solution that works with any release of Quattro or 1-2-3 is a macro that marks the zero rows with a label that begins with the nonprinting label prefix | and instructs the program to omit those rows from the printout. Another solution that works with any

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Master Class: How to Build a Spreadsheet and Survive to Tell the Tale

James Abbott, who has been teaching people in the Southeast about spreadsheet software since the days of VisiCalc, tells a story about a guy who was living in a cardboard box in Central Park, eating out of dumpsters, and mumbling to himself a lot. Seems this fellow had been a golden boy general manager for a Fortune 100 company—you know, the Jaguar, the kids in prep school, the yacht, the penthouse, and so on. He leveraged the buyout of a major competitor with 1-2-3 release 1A. After the deal was consummated and the cash flows turned out to be red instead of black, the auditors examined our hero's spreadsheets and discovered that everywhere he intended to erase a cell, he had instead entered a space. Thus, all the @AVG and @COUNT functions he used gave the wrong answers. The rest, as they say, is history.

Here are six spreadsheet rules to help you avoid a similar fate:

Don't erase with spaces. Never try to clear out a cell's contents by pressing the space bar followed by <Enter>. In 1-2-3 and Quattro, this practice causes certain statistical functions—notably @AVG, @COUNT, @STD, and @VAR—to give invalid answers. For instance, the formula @AVG(A1..A5) is equivalent to the sum of the values in A1..A5 divided by the number of nonblank cells in that range. In this scheme, a cell containing a space is equivalent to a zero: the formula divides by one more for the space, and the average is too small—about the size of a cardboard box in Central Park.

Point, don't type. Never type cell and range addresses when you build formulas. If the formulas are complex, you will sometimes type the wrong address, and you may not discover the error before your pink slip arrives. Instead, use the arrow keys or the mouse to select the cells you want to include in a formula. If the spreadsheet is large, give important cells meaningful range names. Then, as you build formulas, use <F3> to select the names from a list.

Never move data cells. In any spreadsheet, the data cells are the ones you fill in with data—numbers and text—as you work. The other cells contain either formulas that refer to the data cells, static text, or nothing at all. When you move a data cell, whether by dragging and dropping, using the Move command, or cutting and pasting, any formulas that refer to that cell change to refer to the cell's new position. For instance, if cell A1 contains the formula @SUM(B1..B50), and you move the data in B1 to B2, the formula will change to @SUM(B2..B50). Any number you put into B1 from that point on will not be included in the sum. It's a change that's easy to overlook when you're in a hurry—but you'll have plenty of time to reflect on your error while you're standing in the unemployment queue.

Build formulas using dummy data values. Never build complex formulas based on real data values; it's too easy to miss careless errors in formulas. Instead, fill in the data cells with dummy values—1s, 10s, 100s—anything that makes it easy to spot incorrect calculations. When you're done, and you're sure the formulas are okay, erase the dummy values and enter your own.

Make the data cells look different. When you're playing the what-if game in a dense spreadsheet, it's easy to accidentally enter a data value into a cell that contains a formula. This kind of error doesn't show up right away, but it can cause subsequent changes to yield wrong answers, and it's notoriously hard to detect. To avoid these errors, do something systematic to make the data cells look different: In 1-2-3 for DOS, use */Range • Unprot*, which changes the color of the cell text (in Quattro for DOS, it's */Style • Protection • Unprotect*); in Excel and other Windows spreadsheets, you can format the cells so that data cells have lightly shaded backgrounds or different-color text. If you can distinguish a formula cell from a data cell, you won't overwrite it carelessly.

Never sign off on a spreadsheet you don't understand. Today's spreadsheet programs contain lots of exotic analytical tools: statistical tests, solvers, forecasting functions, you name it. Don't simply use this stuff and assume that the answers are truth. Get professional advice, double-check your setup, test your model with a textbook example, do whatever it takes. You know what they say about the word *ass-u-me*.

program is to set up your spreadsheet as a database, fill in the nonzero quantities, then extract the nonzero rows into a report worksheet for printing. I have discussed the database alternative often in these pages—see "Master Class: When Data Works Best" in December 1993 and Timothy Power's question ("Roll Over, Quattro") in June 1993—so I'll focus here on the macro approach shown in **FIGURE 2**.

To set it up, enter the labels shown in B1..D1, the numbers in B2..C11, and the macro code in C14..D19. In D2, enter whatever formula you use to calculate price (I've used C2*1.3 to assume a 30 percent markup) and copy it into D3..D11. Then use the command */Edit•Names•Create* (in 1-2-3, it's */Range•Name•Create*) and name each of the ranges shown in the table at F1..G4. Then designate the range PRINT as the print range: In Quattro Pro, execute */Print•Block*, press **<F3>**, select *Print* from the menu, and press **<Enter>**. In 1-2-3, select */Print•Printer•Range*, type **PRINT**, and press **<Enter>**, then **<Escape>**. To execute the macro, press **<Alt>-Z**. A sample worksheet is available as SKIPZERO.WK1 on PC World Online.

Here's how the macro works: The range TAGS contains the flags that suppress the rows whose quantity is zero. The macro first clears that range (in column A), then steps down through the column of quantities. When a quantity is zero, the macro puts the cell pointer in the corresponding row in column A and enters the word SKIP, preceded by the nonprinting label prefix |. Quattro or 1-2-3 omits from the printout any row that has such a label in the leftmost column of the print range.

Here are the macro details:

D14: {goto}PRINT~{r}{d} positions the cell pointer at the first value in the column that's named Qty.

	A	B	C	D	E	F	G	H
1		Qty	Cost	Price		PRINT	A1..D12	
2		12	$73.00	$94.90		TAGS	A2..A12	
3		10	$11.00	$14.30		\Z	D14	
4		9	$45.00	$58.50		\Z_1	D16	
5		0	$47.00	$61.10				
6		3	$32.00	$41.60				
7		1	$91.00	$118.30				
8		2	$48.00	$62.40				
9		0	$56.00	$72.80				
10		4	$56.00	$72.80				
11		1	$3.00	$3.90				
12								
13								
14			\Z	{goto}PRINT~{r}{d}				
15				{blank TAGS}				
16			\Z_1	{if @cellpointer("type")="b"}{quit}				
17				{if @cellpointer("contents")>0}{d}{branch \Z_1}				
18				{l}|SKIP~{r}{d}				
19				{branch \Z_1}				
20								
21								

FIGURE 2: WANT TO AVOID PRINTING CELLS whose quantity is zero? A macro trick lets you mark those rows using the nonprinting label prefix |; then it skips those rows when you print.

D15: {blank TAGS} clears any previous skip tags from column A.

D16: {if @cellpointer("type")="b"}{quit} halts the macro after it has processed the last quantity.

D17: {if @cellpointer("contents")>0}{d}{branch \Z_1} checks to see if the current quantity is more than zero. If it is greater than zero, this statement selects the next cell and returns the macro to D16.

D18: {l}|SKIP~{r}{d} runs only if the quantity is zero. The statement selects the left adjacent cell, enters the tag |SKIP, and then selects the next quantity.

D19: {branch \Z_1} returns the macro to D16 to process the next quantity.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions (see page 12 for contact information).* ■

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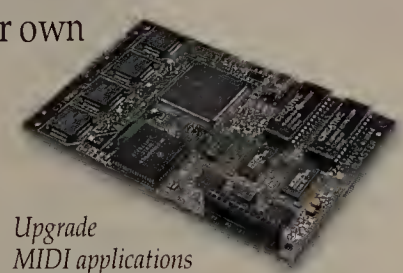

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Bundled Hardware		Microphone	Microphone
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WORD PROCESSING Q & A

Fractionating in Ami Pro 3.0

Q I often need to include fractions in my Ami Pro 3.0 documents. While I can insert the fractions ¼, ½, and ¾ using the Windows 3.1 Character Map application, I'd like to be able to use fractions like 7/16 and 17/32, which are not available. I know I could use the Equations editor feature, but this seems like overkill. Is there an easier solution?
Susan R. Taylor, Alameda, California

A The solution to your problem isn't all that difficult, but it requires a written macro since the numbers in your fractions will probably change. To create the macro, first enter the text shown in **FIGURE 1** into a blank Ami Pro 3.0 document. Check your typing carefully, and then select *File•Save As*. In the Save As dialog box, choose the *Ami Pro Macro* entry in the List files of type drop-down list. Next, enter **FRACTION.SMM** in the File name text box, and then click *OK* or press **<Enter>** to save the macro. Or you can download FRACTION.SMM, ready-made, from PC World Online.

Since you'll use this macro frequently, you should probably assign a keystroke shortcut to it. To do this, select *Tools•Macros•Edit*. In the Edit Macro dialog box, highlight the *fraction.smm* entry in the Macros list. Then click in the Playback shortcut keys box and press your desired shortcut key combination. To avoid conflicts with preexisting keystrokes, I suggest using **<Ctrl>-<Shift>-F**. Click *Save* and then *OK* to save your key combination. Finally, select *File•Save* to make your changes permanent. You can then close the window that is displaying your macro codes.

To use the macro in your document, position the cursor, then press **<Ctrl>-<Shift>-F** or whatever shortcut key you assigned. Type the numerator for your fraction in the dialog box that appears, press **<Enter>**, and then type the denominator in the next dialog box and press **<Enter>** again. You'll see your fraction displayed correctly on the editing screen.

Here's how the macro works:

SpecialEffects(64 "") sets up superscript formatting.

Numerator = Query$("Enter your numerator") prompts you for the numerator.

Type({Numerator}) types the numerator variable into your document.

SpecialEffects(0 "") restores normal formatting to the rest of the document.

Type("/") types a slash in the document for your fraction.

SpecialEffects(128 "") sets up subscript formatting.

Denominator = Query$("Enter your denominator") prompts you to type in the denominator.

Type ({Denominator}) types the denominator variable into your document.

SpecialEffects(0 "") restores normal formatting once again.

Type(" "), of course, simply types a space.

```
FUNCTION FRACTION1()
SpecialEffects(64 "")
Numerator = Query$("Enter your numerator")
Type({Numerator})
SpecialEffects(0 "")
Type("/")
SpecialEffects(128 "")
Denominator = Query$("Enter your denominator")
Type ({Denominator})
SpecialEffects(0 "")
Type(" ")
END FUNCTION
```

FIGURE 1: CREATE ANY FRACTION IN AMI PRO with the help of this simple macro Instead of the Equations editor.

Getting Ahead With WinWord Envelopes

Q I like to print a year's worth of envelopes for recurring mailings, such as rent and electric bills, at one time. But with Word for Windows 2.0c, I can print only one envelope at a time on my Hewlett-Packard LaserJet Series III printer. Since I have an envelope tray, it should be easy to print all 12 envelopes in a single pass, but I can't figure out how to do it.
Dan Beauzile, Niagara Falls, New York

A Word for Windows can do what you want, although it's not all that obvious how. The problem occurs because direct envelope printing bypasses the Print dialog box, which is where you normally set the number of copies. To print multiple copies on a LaserJet Series II or Series III printer, there's a step that you must take before you click the Envelope icon on the tool bar or execute the Tools•Create Envelope command.

First, select *File•Print Setup*. Then, in the dialog box, with your current printer highlighted, click the *Setup* button. In the next dialog box, enter the number of copies that you want and

USER GROUP TIP

Clean Starts in WinWord

When I load Microsoft Word for Windows from Program Manager, I don't want a new, blank document based on the default template; I just want the program. Here's how I get it: In Program Manager, click on the Word for Windows icon and press <Alt>-<Enter>. In the resulting dialog box, go to the Command Line field, add a space and /N after the file name WINWORD.EXE, and then press <Enter>. The next time you double-click that icon to load Word for Windows, the program will come up without a new, blank document.

Alex Goldfinger
Amateur Computer Group of New Jersey

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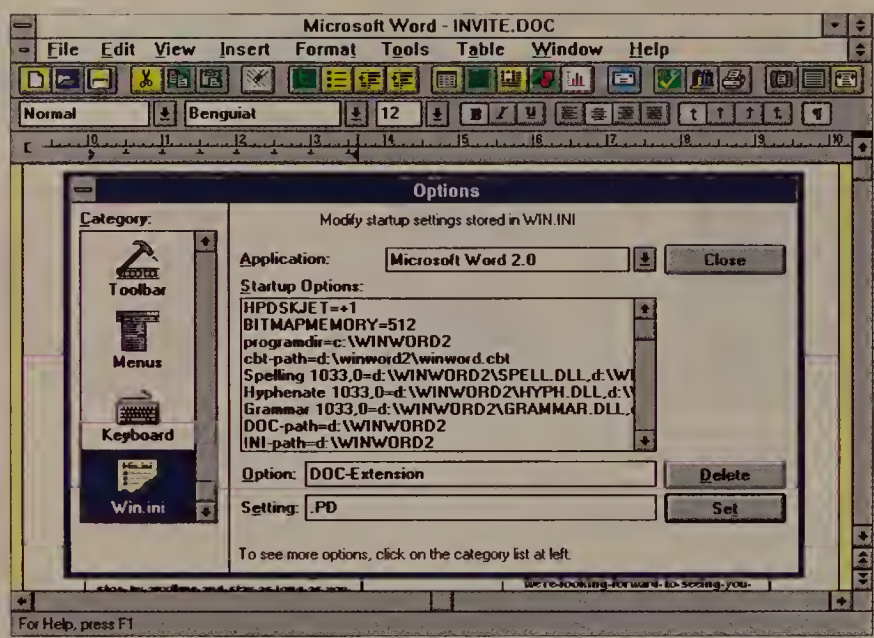

FIGURE 2: CHANGE THE DEFAULT EXTENSION for your WinWord document files to any DOS extension using the Tools • Options command.

then select *OK* twice to return to your document.

If you don't see a Copies field, it may be because your printer doesn't support multiple copies in this way. If that's the case, you'll have to print your envelopes one at a time.

Now click the *Envelope* icon or select *Tools•Create Envelope*. Fill in your address information and then select the *Print Envelope* button. You'll get however many copies of the envelope you specified during the previous step. Just be sure to put your envelope tray in the printer before beginning the print job.

A final note: If your printer tells you to insert an envelope manually, select *Tools•Options* before the next envelope printing session. Choose the *Print* icon in the Category list, and check the *Printer's Envelope Feeder has been Installed* option. With that box checked, your printer will feed from the envelope tray automatically.

Changing Default File Extensions in WinWord

Q I'd like to change the default DOC extension in Word for Windows 2.0c to my initials. This would make my documents easier to find, but typing in that extension each time I want to load or save a file is tedious. Can you help?
Patrick Dunphy, Joinville, Brazil

A Sure. With Word for Windows running, select *Tools•Options*. Choose the *Win.ini* icon in the Category list. Next, click inside the Option text box, and change the current text so that it reads **DOC-Extension**. Then you click inside the Setting text box, delete the old text, and type **.PD** or whatever other extension you want to use as a default (see **FIGURE 2**). Finally, check your typing and then click the *Set* button followed by *Close* to save the settings and return to your document.

For this change to take effect, you will have to restart Windows. Once you do, you will find that your new extension has become the default and will show up whenever you select File•New, File•Open, File•Save, or File•Save As.

Squeezing Text in WordPerfect 5.1 for DOS

Q From time to time, I need to compress a block of text in order to make it fit into a smaller space. I have been choosing a smaller font size whenever possible, but with fixed fonts such as my laser printer's Courier, this approach will not work. Do you know if there is anything that I can do to tighten things up?
Sid Fleischer, Boise, Idaho

A Great question. Start by positioning the cursor at the spot where you want to begin tightening up text. Then press **<Shift>-<F8>463**. If you're using drop-down menus, select *Layout•Other•Printer Functions•Word Spacing*. Now you're ready to begin changing either the spacing between words or the spacing between individual letters. In most cases, it's best to change both equally.

To tighten up the word spacing, press **3** or select *Percent of Optimal*. Type in a value that represents a percentage of the original spacing, then press **<Enter>**. A good starting value is 90 percent. Repeat the same process in the menu for letter spacing, using the same value. When you're done, press **<F7>** to return to the editing screen. Notice that you can stretch text as well by entering a value larger than 100.

If you want the entire document to be compressed, you're finished. However, if you want to compress just part of the document, move the cursor to the end of the text to be compressed and repeat the steps above, setting the word and letter spacing to their *Normal* or *Optimal* values. But don't try to use these commands on a marked block of text; they won't work.

WordPerfect 6.0 Button Navigation

Q I love the new multiple button bars in WordPerfect 6.0 for DOS, but displaying a different button bar is a pain. You either have to plow through menus or use the button marked BBar Sel, which is a standard feature on the program's stock button bars. But using BBar Sel requires scrolling all the way to the next line of buttons. Is there a way to fix this?
Alan Bridges, Philadelphia

A Sure. You can move any button to any position on its bar. I would advise making the BBar Sel button the first button on every bar to make navigation easier.

First, select *View•Button Bar Setup•Select*, highlight the button bar that you would like to modify, and click *OK*. Next, select *View•Button Bar Setup•Edit*. Scroll down the list of buttons in the dialog box that appears, and then highlight *BBar Sel*. Now select *Move Button*.

Scroll back up to the top of the list of buttons, and highlight the first button. Select *Paste Button* to insert the BBar Sel button at the top of the list. Click *OK* or press **<Enter>** to finish the job and store the new arrangement as the default. Repeat this operation for each button bar, and you'll always have instant access to your entire list of specialized button bars.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing *welcomes your questions. See page 12 for contact information.*

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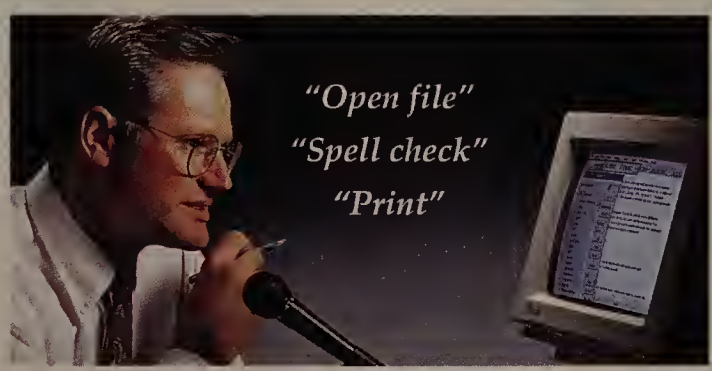

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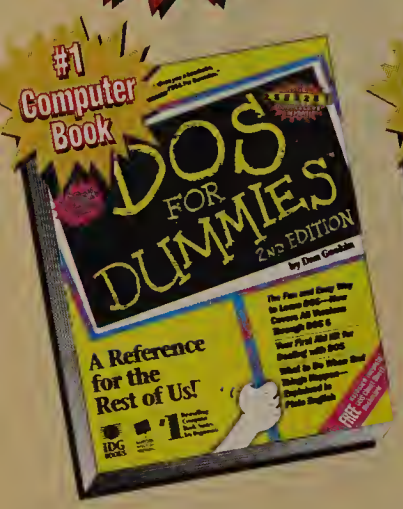

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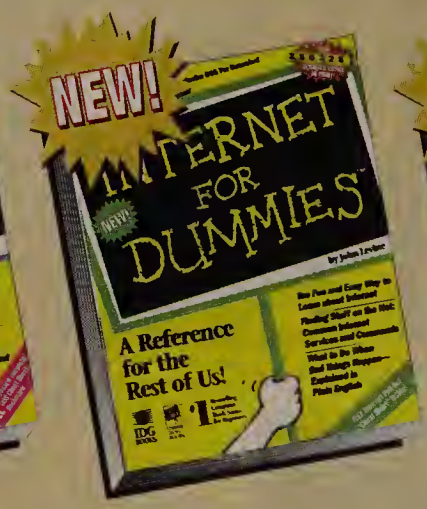

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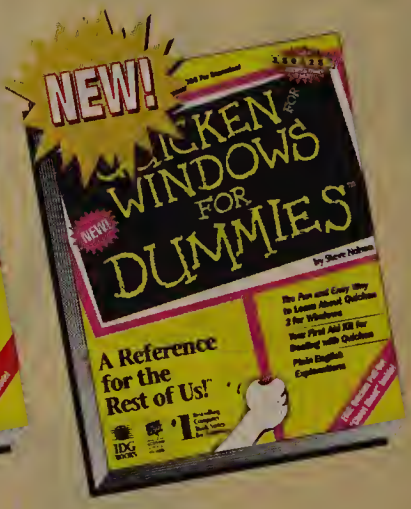

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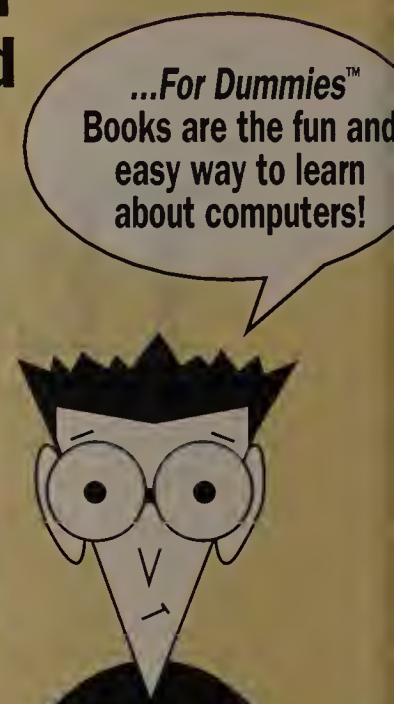

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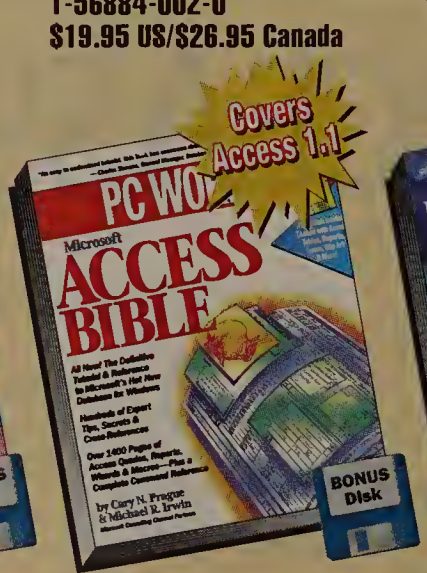

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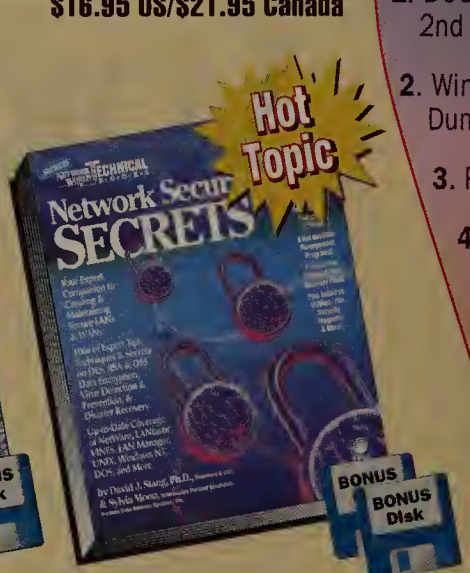

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WINDOWS Q & A

Swap Files and DoubleSpace—NOT

Q I just got DOS 6.0, and I plan to compress my hard disk using DoubleSpace. But I've heard that you should never create a permanent Windows swap file on a compressed drive. Is this true?
Norma Cathcart, Los Angeles

A All too true. An easier approach is to create the permanent swap file first, exit Windows, and *then* run DoubleSpace. DoubleSpace will automatically detect the swap file and leave it on the uncompressed drive.

However, if you've already done the reverse, you'll have to untangle a few things. After you've created the swap file on a compressed drive, Windows will tell you that 'the permanent swap file is corrupt' and ask if you want to delete it. Press **Y**, and when you're back in Windows, open *Control Panel* and select *386 Enhanced•Virtual Memory*. When Windows asks if you want to 'Set corrupt file to zero length now?' click *Yes*. Then click *Change*, and in the New Settings section of the Virtual Memory screen, select *None* from the Type list. Confirm your actions when Windows asks you to, and restart Windows.

To create a swap file without tears, do the following: Run DOS's disk defragger (or one that's compatible with DOS 6.*x*) on the uncompressed drive to pull together as much free contiguous disk space as possible. Load Windows, click your way back into the Virtual Memory screen, select the uncompressed drive for your permanent swap file, select *Permanent* from the Type list, and click *OK*. When you reload Windows, you'll find that your swap file is in the right place.

If you need to allocate more space to the uncompressed drive for a swap file, exit Windows and type **DBLSPACE** at the DOS prompt. Select the compressed drive to shrink, and choose *Drive•Change Size*. In the Change Size dialog box, specify a New Free Space on the uncompressed drive that's large enough to accommodate a permanent swap file of the desired size, and click *OK*. Then run Windows and follow the procedure already described to create the swap file.

Trimming the Driver List

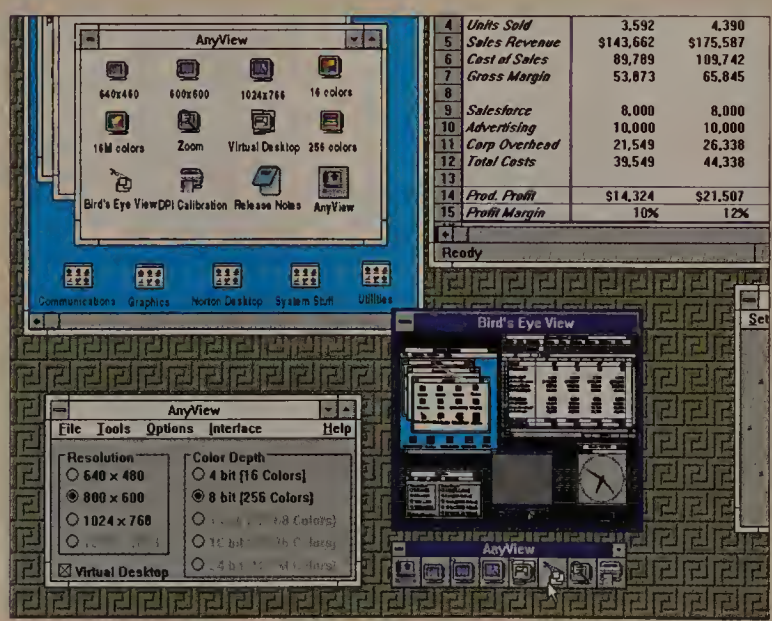
Q When I run the Windows Setup utility and select Options•Change System Settings•Display, I see tons of video drivers that I don't need. I've gone through the WINDOWS\SYSTEM directory and deleted drivers that I recognize, but they still appear in Setup's Display list. How can I remove them from the list permanently?
Alan S. Ayer, Houston, Texas

A You need to update the Display list information, typically found in the SETUP.INF file in the WINDOWS\SYSTEM directory. After making a backup of the file, open SETUP.INF with Windows Write or any text editor (the file may be too big for Notepad), locate the [display] section, and place a semicolon at the beginning of the line where a deleted driver is referenced (a semicolon at the beginning of a line tells Setup to ignore that line). There's a lot of clutter in this file, so search for the name as shown in the Display list, such as 'Video 7 512K, 640x480 256 colors driver'. You'll find the name in quotes and preceded by something like 'v7vga = 2:v7vga.drv'. Type a semicolon at the start of the line, repeat this for every deleted driver, and then save SETUP.INF as text only. The next time you run Windows Setup, you won't see the deleted drivers listed. If you ever need them, just remove the semicolons from SETUP.INF.

Even if you delete your drivers, don't delete their lines from SETUP.INF. By commenting a line out with a semicolon, you can add it back to the list later by simply removing the semicolon. When you select a deleted driver in the Display list, Windows will prompt you for the disk containing the driver.

If you can't find a driver listed in SETUP.INF, chances are it came from a third-party vendor. Look for other INF files in the WINDOWS\SYSTEM directory. These typically begin with OEM and end with the INF extension, such as OEMPANA.INF. To remove

Windows Toolbox



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the driver listings, you can edit the vendor's INF file using the steps outlined previously, or delete it. If you do the latter, first copy the INF file onto a floppy—you may need it if you change your mind or get a new video board from the same manufacturer.

Wild Cards and File Manager

Q I've found that manually deleting a lot of files when I'm in File Manager can take what seems like forever. Is there a way that I can speed up the process using DOS-like wild cards?
Vinay Mehta, Lennoxville, Quebec, Canada

A Many File Manager commands—including Move, Copy, Delete, Rename, Search, Select Files from the File menu, and View•By File Type—accept the wildcard characters ? and *.*. For instance, to copy all of the current directory's TXT files to drive B:, select *File•Copy* (or press **<F8>**), type ***.TXT** in the From box and **B:** in the To box, and press **<Enter>**. You can even use multiple file names or extensions, separated by spaces or commas, although these won't work in the To boxes for the Copy, Move, and Rename commands.

The Select Files command is especially handy because it leaves the dialog box open while you fiddle with parameters. Say you want to delete all WRI and TXT files in a directory. Choose *File•Select Files*, type ***.WRI *.TXT** in the text box, and click *Select*. File Manager will select all of the WRI and TXT files in its active window's Directory pane. If you decide to deselect a specific file or file type, just type the file name (JONES.WRI) or file type (such as *.TXT or REPORT*.*) in the text box and click *Deselect*. When you're done, click *Close* and take the desired action, such as dragging the selected files to another folder or pressing the <Delete> key.

If you don't need to review selected files, simply select *File•Delete*, type ***.WRI *.TXT**, and click *OK*. To speed things up further, choose *Options•Confirmation*, and uncheck the File Manager prompts you don't want.

Unfortunately, File Manager dialog boxes can't accept most DOS switches; for instance, you can't use /v to verify the accuracy of a copy. But you can print unformatted ASCII text files quickly with the Copy command. Select the file, choose *File•Copy*, type the port name (such as **LPT1**) in the To box, and click *OK*. You may have to press the printer's formfeed button in order to eject the page.

Adjusting Task Manager's Tile Style

Q I use File Manager's drag-and-drop talents to add new icons to Program Manager or to open files in currently running programs, and I pop up the Task Manager and press the Tile button to arrange File Manager alongside the other windows. But this arrangement obscures much of the file list. Is there a way I can tile windows top to bottom instead of left to right?
Bruce Benson, Taos, New Mexico

A No problem. Press **<Ctrl>-<Esc>** to display Task Manager, and hold down **<Shift>** while clicking *Tile*. The windows will be arranged top to bottom.

Unfortunately, this trick won't work if you

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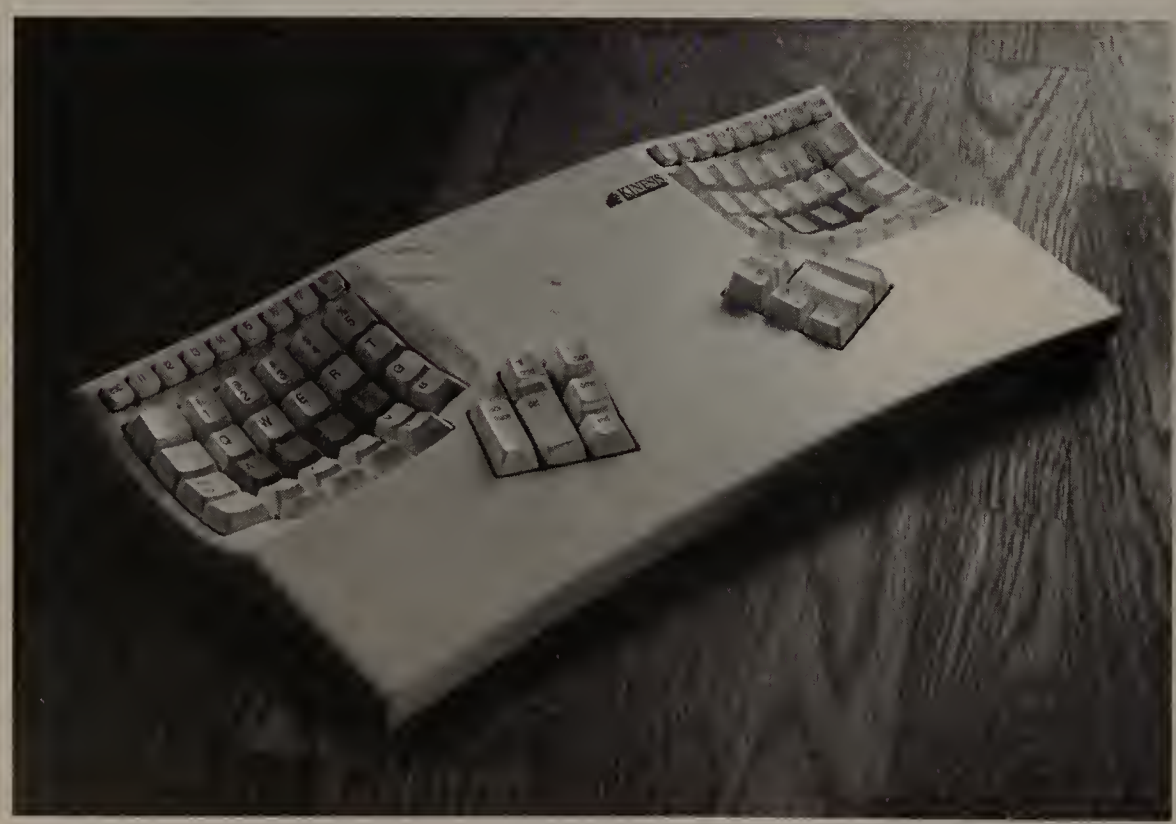

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have more than three windows open. If you do, simply minimize the windows that aren't involved in your dragging task.

Lasso Them Wandering Icons

Q One thing I hate about Windows is its floating icons. When I double-click an icon, the mouse sometimes slips and the icon is nudged to the side. Can I fix my icons in place, and still be able to move them later if necessary?

John Spano, Kalamazoo, Michigan

A The simplest way to straighten up icons in Program Manager is to select *Window • Arrange Icons*. A more automatic approach: Go to the Options menu and make sure *Auto Arrange* is checked. Either of these commands snaps the icons to a predefined spacing grid; you can change the grid under the Icons in the Desktop section of the Control Panel.

Taming minimized icons on the desktop is trickier. One method is to slow down the double-click speed, allowing Windows to ignore icon movement between the first and second click.

To set the double-click speed, launch Control Panel, double-click Mouse, locate the Double Click Speed scroll bar, move the scroll box all the way to the 'Slow' side, and click *OK*.

If this doesn't do it, try adjusting WIN.INI to expand the area around an icon that's double-clickable. In Program Manager select *File • Run*, type **WIN.INI**, and press **<Enter>**. Locate the DoubleClickHeight= and DoubleClickWidth= statements inside the [windows] section, and increase their values to 20 or 30 (they'll probably both be set at 4). If these lines aren't present, type them in. Save the file, restart Windows, and your icons will never mosey off the ranch again.

By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992).* Windows *welcomes your questions.* *See page 12 for contact information.* ■

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PC WORLD

OS/2 Q & A

High Resolution Video Drivers

Q I recently switched to a super-VGA video card. OS/2 2.1's installation seemed easy enough at first, but about halfway through I got a dialog box with the option to 'Install Using Display Adapter Utility Program'. What does this mean?
Tim Bartz, St. Paul

A OS/2 needs to know about your hardware, and your graphics card probably came with a utility that helps the operating system find out. To install a new video driver, start by typing **DSPINSTL** at an OS/2 command prompt.

In the resulting dialog box, click *Primary Display* to put a check mark next to it, then click *OK*. This will bring you to another dialog box where OS/2 will ask you for your video chip type; the default that OS/2 selects for you is usually correct, so just click *OK*. The third dialog, Monitor Configuration/Selection Utility, asks for the utility program.

So what is this utility OS/2 is asking for? When you bought your super-VGA video card, it probably came with a disk full of device drivers, utilities, and demonstration programs. One of those programs is a DOS utility—probably called something like SETVGA or VMODE—that lets you set your resolution and other video options. OS/2 needs this information to confirm which video chip your graphics card uses, the resolution you want to run, and whether you need an interlaced display.

If you have such a program available and know where it is, select *Install Using Display Adapter Utility Program* and click *OK*. Then enter the path and file name of your DOS video card utility program. Your screen may buzz and flicker a few times as OS/2 runs the utility and checks the video card settings (you can later confirm that OS/2 detected the correct video chip by going to a full-screen DOS session and typing **SVGA Status**). You'll then see a dialog box from which you can choose your display resolution. After you choose one and click *OK*, OS/2 will prompt you for the proper disks to insert for the driver. When the installation is finished, shut down your system and reboot for the changes to take effect.

Never Use the Reset Button

Q I know that I should run OS/2's Shutdown command before turning off my computer, but sometimes my system locks up and I have to use the Reset button or press <Ctrl>-<Alt>-<Delete>. When that happens, sometimes I lose the data I'm working on, and sometimes I don't. What's up?
Janet Cyr, Dallas

A Under DOS, there's usually no significant difference between hitting the Reset button and pressing <Ctrl>-<Alt>-<Delete>. This isn't true with OS/2, however.

To improve performance, OS/2 has a disk cache that stores data in memory before writing it to your hard disk. But what do you think happens if the data is still waiting in memory when you reset your computer? The data vanishes.

OS/2 is smart enough to trap <Ctrl>-<Alt>-<Delete>. When you press these keys, you get the message 'The system is rebooting...', showing that OS/2 has trapped your keystrokes. OS/2 then flushes out the cache and saves the changes to disk before shutting down.

On the other hand, when you press the Reset button, your PC is reset beyond OS/2's control, and anything that was in memory—including your changes—simply disappears.

The moral of the story is to avoid the Reset button at all costs. Use the Shutdown option whenever you can, but when OS/2 locks up, try pressing **<Ctrl>-<Alt>-<Delete>** first.

Moving Windows

Q Sometimes a window or dialog box ends up off screen and I can't retrieve it with the mouse. How can I get it back?
Patti Crocker, Vacaville, California

A You can't move a window with your mouse if you can't click on its title bar, and under certain circumstances—for instance, when you change video resolutions—a title bar can disappear off the edge of the screen. There are two ways to move a window if this happens to you.

If you have only one problem window, click on it to make it active, then press **<Alt>-<F7>**. You can then move it with the cursor keys or mouse. Press **<Enter>** when you're done.

If you have a number of errant windows, press **<Ctrl>-<Esc>** to bring up the Window List, then hold down the **<Ctrl>** key as you click on all the entries you want to move. Right-click one of the highlighted entries to bring up the pop-up menu, and select *Cascade* or *Tile* to rearrange only the selected items.

By Lou Miranda

Lou Miranda is an OS/2 programmer-consultant based in Minneapolis/St. Paul. OS/2 welcomes your questions. See page 12 for contact information.

From Windows to OS/2

TERMINATING A MISBEHAVING APP: One of the best things about Windows 3.1 is the way you can kill an malfunctioning program with the <Ctrl>-<Alt>-<Delete> "three-fingered salute." But pressing those three keys in OS/2 will reboot your system.

Luckily, there is a simple way to terminate unwanted applications in OS/2: Press <Ctrl>-<Esc>, then wait. If the application is truly tying up the system and not responding to system requests, you'll eventually get a dialog box stating just that. Then you just press <Enter> to kill your application.

If your application is still alive out there, you'll get the Window List that <Ctrl>-<Esc> usually brings up. You can still terminate the application (without saving any data) by right-clicking the application name to bring up the pop-up menu, and selecting Close.

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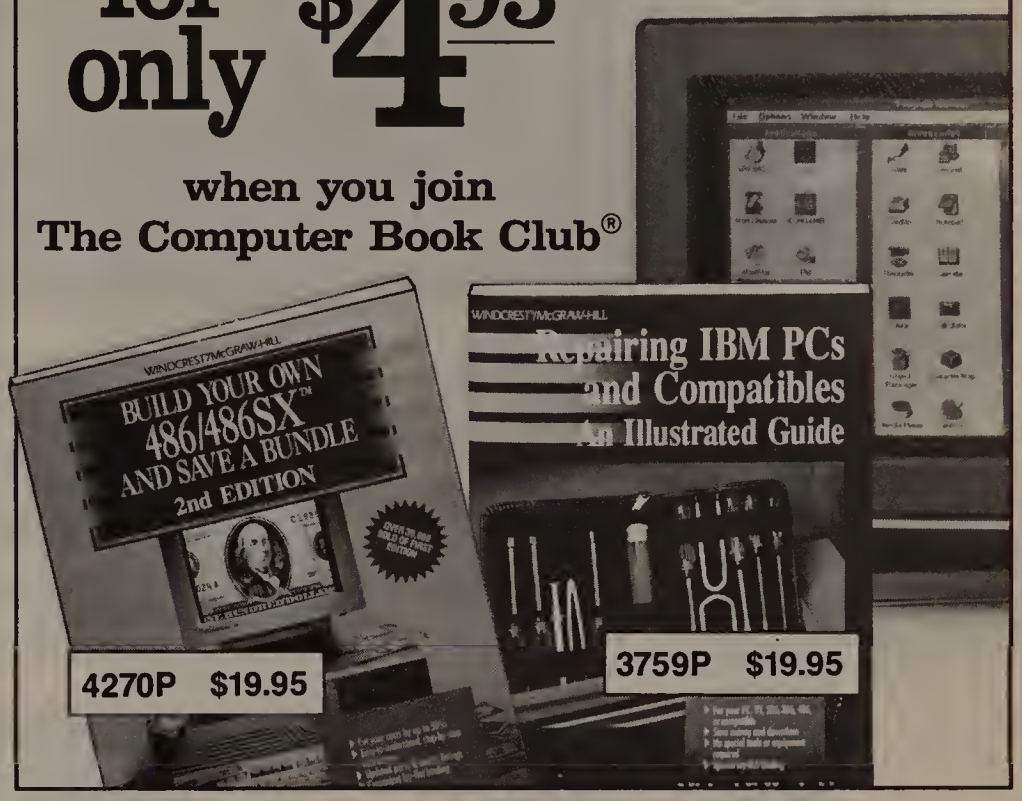

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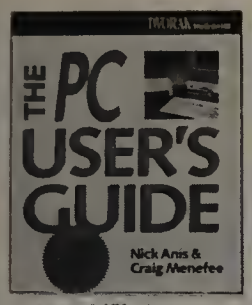

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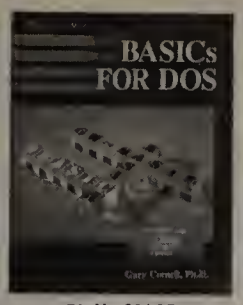

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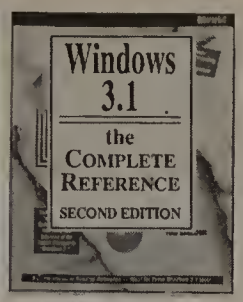

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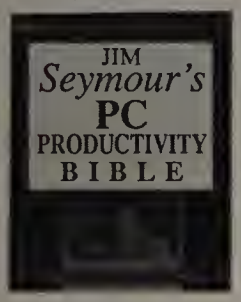

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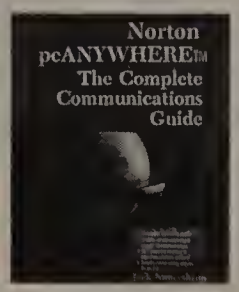

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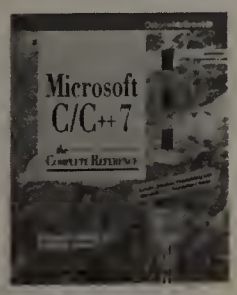

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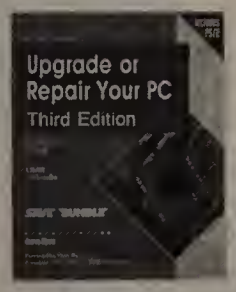

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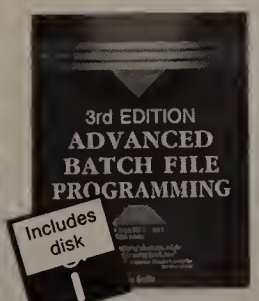

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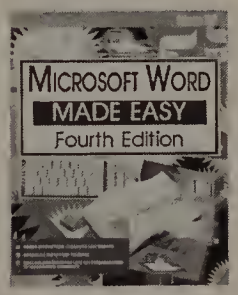

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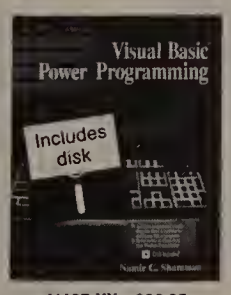

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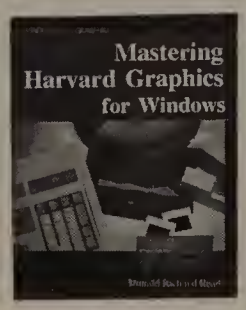

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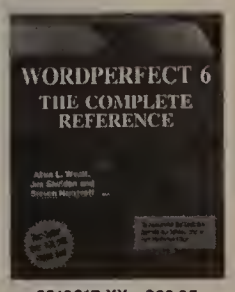

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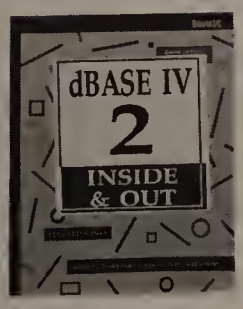

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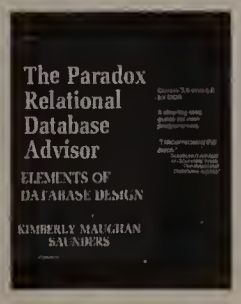

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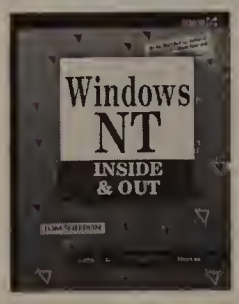

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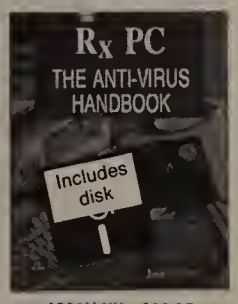

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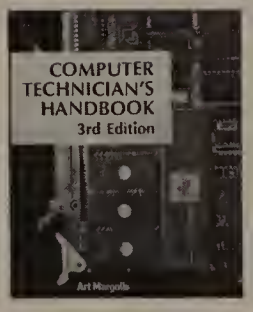

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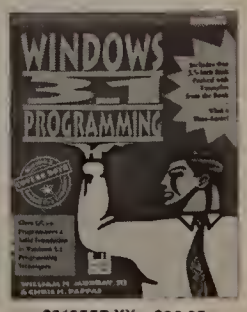

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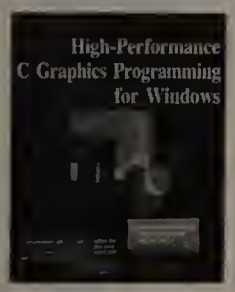

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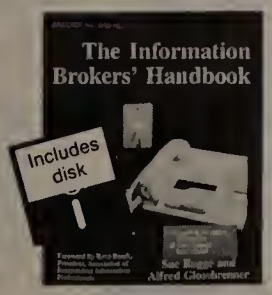

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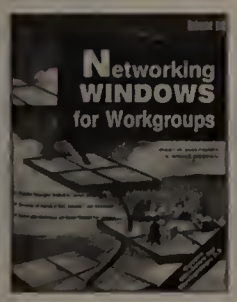

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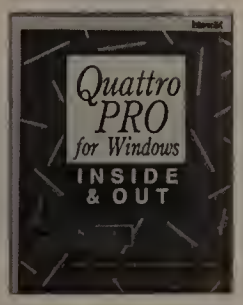

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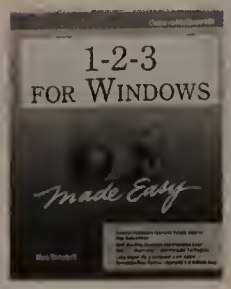

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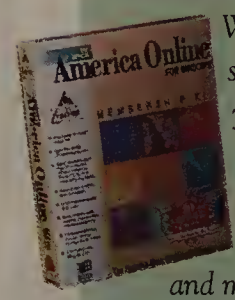

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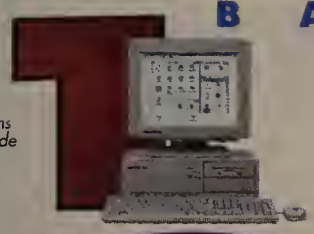

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DATA MANAGEMENT Q & A

Getting dBASE Ready for Work

Q Every time I load dBASE III Plus, I go through the same steps to set up my work areas—I change a few settings, open my data files with their indexes, and so on. This is really getting tiresome. Is there some way to automate these tasks so that dBASE performs them every time I start it?
Don Leonardi, Los Angeles

A You can create a simple program that does everything you normally do when you start dBASE, and then customize dBASE so that it runs this program every time it's loaded. And no, you don't have to be a programmer to do it. The following instructions work for dBASE III Plus and dBASE IV.

To create the program, simply enter the commands you usually run when you load dBASE in an ASCII text file called STARTUP.PRG; to use the editor that comes with dBASE, use the command **MODIFY COMM STARTUP**. If you use the Assistant instead of typing in the commands yourself, get everything in place as you usually do, then press **<Esc>** to go to the dot prompt and enter **LIST HISTORY TO PRINT**. This will print a copy of the commands you need in your STARTUP file, which you can read as you type them in. Check **FIGURE 1** for a sample startup program that will give you the general idea.

After you've created STARTUP.PRG, you must change another ASCII text file, CONFIG.DB, to tell dBASE to execute this program every time it loads. By default, CONFIG.DB—which should already be in your DBASE directory—has just two lines: STATUS=ON and COMMAND=ASSIST. Change the COMMAND line to **COMMAND=DO STARTUP** and save the file. The next time you start dBASE, the program will run your commands automatically.

By the way, if the only commands that you run after loading dBASE are SET commands, you don't need to bother with creating a PRG file. Adding the line CARRY=ON to CONFIG.DB will have the same effect as putting SET CARRY ON in your STARTUP.PRG file.

```
SET CARRY ON
USE C:PROJECTS INDEX PROJNUM
SELECT 2
USE C:STAFF INDEX LASTNAME
SELECT 1
APPEND
```

FIGURE 1: SET UP DBASE every time you load it with a startup program such as this one.

Restarting a dBASE Report From the Dot Prompt

Remember Blaine Fuhrman's problem with restarting a dBASE III Plus report after a printer jam ("Getting Out of a Jam With dBASE Labels," August 1993)? George W. McLellan of Chapel Hill, North Carolina, sent in a better solution than mine, and his doesn't require any programming.

Once you've fixed your printer, use the FIND command to get to the last record printed. For instance, if the data file is indexed by last name, and the last record printed is for John Jasper, enter **FIND "Jasper"**. Then enter **SKIP** to get to the next record—the first one that wasn't printed—and enter **LABEL FORM** *formname* **TO PRINT NEXT** *n*, where *formname* is the name of your form and *n* is a number greater than the number of records left to be printed. You don't have to know exactly how many records are left to print—anything bigger than the highest possible number will do. That's all! Your report will start again where it left off.

Varying Font Sizes in Paradox

Q I'm using Paradox 4.0 to track registration information for conventions and print badges for attendees. Is there a way to make Paradox change the point sizes for each of the fields so that one can be 32 points and the others 18? Also, my company is in the process of changing to a Windows environment, and I'd like to know whether my Paradox 4.0 applications will work with Paradox for Windows.
Alan Biren, Plainview, New York

A Yes, there's a way to print some fields in different—and larger—fonts than others in Paradox 4.0. It involves using your printer's control codes, something that nearly all non-PostScript printers have. You didn't tell me what printer you're using, so I can't give you the exact codes, but the basic approach remains the same.

First check your printer manual to see what control codes are needed for printing the fonts you want and have available. Usually this information is included in an appendix called Printer Control Codes, Command Sequences, or something like that. Then go into the report you use to print your labels, and make room for a calculated field on either side of the regular field you want to change. Make sure to leave enough space for the entire length of the control code string. Don't worry that your field is getting pushed to the right in the report layout—when the report is printed, the control codes will be "eaten" by the printer and won't take up any space on the page.

Next, move the cursor to the first space you made—the one before the field you want in a larger font—and select *Field•Place•Calculated*. In the resulting calculation box, enter—within quotation marks—the control code for printing your large font. Where your manual has you enter an Escape character as part of a control code, substitute **\027**. Then place another calculated field, this one with the code for returning to your normal font, after that field or fields.

Some control codes get pretty long and complicated, and many are made up of several pieces: one for type style, another for size, another for boldface, and so on. For example, on my LaserJet-compatible OkiLaser 400, printing

bold Swiss type with a 14.4 point size requires the code "\027(s1p14.4v0s3b4T". To go back to my default 10-point Helvetica, I must use "\027(s0p10h12v0s0b3T". If your printer doesn't support scalable fonts, be sure to choose a point size that your type style comes in.

Regarding your last question, you can use Paradox 4.0 data files in Paradox for Windows, but that's about as far as it goes. You can't use the same forms, reports, or applications, as the Windows version handles these tools in an entirely different way.

Recording Incomplete Dates in Paradox for Windows

Q Working for a law firm, I often enter data from documents that have incomplete or missing dates. Sometimes only the month or year is available for a particular document, and other times not even that. The problem is that Paradox for Windows won't let me enter a date such as 05-00-84 or 00-00-91, to say nothing of 00-00-00, which I use to show that a date is missing, not just forgotten during data entry. Is there any way to get Paradox for Windows to accept these incomplete dates? I've thought of making my data fields alphanumeric, but if I do that, they would lose the data-entry controls inherent in a date field.

James Barrett, Minneapolis

A I'm afraid Paradox for Windows won't permit you to enter the dates you describe in a date field. But if you do change your date fields to alphanumeric, you can use picture validation to restrict data entry in a way that is similar to how date fields do it. You still won't be able to do date arithmetic, but as Paradox would not know how to perform calculations with your incomplete dates, you probably aren't doing it anyway.

To change your date field and add a "picture," select *Table•Restructure* if your table is open on the desktop, or *File•Utilities•Restructure* and the name of your file if it isn't. Change your date field's type to **A**lphanumeric and its size to **10**. With the field still selected, choose *Validity Checks* from the Table Properties drop-down menu on the right side of the dialog box. Click on the *Picture* box and enter **##/##/####**. This will force the user to enter two digits each for the month and day and four digits for the year; a four-digit year is preferable as we approach the end of the century. Paradox will automatically fill in the slashes as the numbers are entered. To close the dialog and save the table with its new structure, click *Save*.

The picture noted above doesn't check for valid months and days, and it will allow you to enter dates like 13/79/1994. If you want more control, enter **{0{0,1,2,3,4,5,6,7,8,9},1{0,1,2}}/[{0,1,2}{0,1,2,3,4,5,6,7,8,9},3{0,1}]/####** in the Picture box. This picture will still let you enter 4/31/1994 or 2/29/1995, but it will stop the more extreme errors.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of the* Paradox 4.0 Handbook *(Bantam Computer Books, New York, 1992).* Data Management *welcomes your questions. See page 12 for contact information.* ■

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PC WORLD

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PUBLISHING & PRESENTATIONS MAKEOVER

Keep It Simple

Thoreau may not have been a desktop publisher, but when he cautioned us to "simplify, simplify," he was talking like one. Simplifying the design of published materials is the key to maximizing their impact.

This month's make-over candidate comes from the Insurors of Tennessee, a trade association for insurance agents. Bill Wilson, director of the association's education and membership services, advertises seminars by inserting fliers into the group's semimonthly newsletter. He creates the fliers using PageMaker and a 33-MHz Zeos 386.

The flier's original design is too busy. The page consists of six boxes of text, plus titles, a logo, and a routing box at the top. These elements compete with each other visually, making it hard for readers to know where to start.

The solution: Eliminate superfluous elements, then assemble the remaining components in a more readable order.

Break It Down

The most important information on the flier is the title of the seminar, "Business Income Coverages." But in the original design, the title is surrounded by less important elements. To reduce this clutter, we enlarged the title and set it against a white background. Then we combined the lines "Insurors of Tennessee" and "Advanced Seminar Series" into a single line, moved the TSI logo to the bottom of the page, and eliminated the "Route to:" box.

Next we turned our attention to the rest of the page. In the old layout, the text in the six boxes covers three topics: why the course is being offered, what it will cover, and who should attend. We removed the boxes and rearranged the copy into three sections of straight text.

The old layout relegates the *why* of the seminar to a box on the right side of the page headed "Producers." We extracted this text from the box and moved it to a column on the left, which helps introduce the rest of the page.

Next we consolidated the information from two boxes that tell readers *what* the seminar will cover ("Top Five Reasons To Attend This Seminar" and "Additional Course Content Details"), moved it to a middle column, headlined it "What We'll Cover," and added bullets to identify it as a list.

We took the information about *who* should attend the class from the boxes "Intended Audience" and "Experience Level," moved it to the middle column, and added the subhead "Who Should Attend." Finally, we recast the box titled "CE Credit Hours" as a small table at the bottom of the page.

Little Boxes

Having answered the who, what, and why of the seminar, we felt obliged to cover *when* and *where*. A calendar is a logical means to do so. But since a calendar is fundamentally different from plain text, we wanted to differentiate it visually from the previous two columns. The solution: We put a box around it and filled it with a light screen.

As part of our effort to reduce the number of visual elements, we reduced the number of typefaces. The original is a hodgepodge of Helvetica and Times Roman in italic and bold. We replaced these with Century School Book and stuck to a more consistent use of uppercase and lowercase lettering.

By David Brickley and Dan Miller

The redesign was performed by David Brickley, a designer based in Moss Beach, California. Dan Miller is an assistant editor for PC World. Publishing & Presentations *welcomes your business document and presentation make-over candidates and your publishing and presentations questions.* *See page 12 for contact information.*

Before

Route to:

Insurors of Tennessee
ADVANCED SEMINAR SERIES

T·S·I
Tennessee School of Insurance

BUSINESS INCOME COVERAGES
An Advanced, 1/2-Day Seminar for Experienced Personnel

Top Five Reasons To Attend This Seminar

1	**Learn how to "decipher" the BI worksheet.** *How to complete the worksheet and calculate coverage limits.*
2	**Differences between the 1985, 1988, 1990, & 1991 forms.** *And the advantages of the 1991 coverage form for clients*
3	**When Off-Premises Power Failure Coverage is needed.** *Ask your fellow agents in East Tennessee!*
4	**What time element coverage is NOT offered by a BOP.** *While coverage may appear generous, there are gaps!*
5	**What "Optional Coverages" are available.** *They may be less complicated, but some are VERY expensive!*

Intended Audience	Experience Level	CE Credit Hours
✔ Principal	❑ Introductory	Tennessee 4
❑ Manager	❑ Basic	Georgia 3
✔ Producer	✔ Intermediate	CPCU 4
✔ CSR/Claims	✔ Advanced	AAI 4
❑ Clerical	❑ Personal	
✔ Company Rep	✔ Commercial	*This seminar has been FILED for the above hrs.*

Additional Course Content Details

- When does business income coverage stop? *(It could be before the insured thinks it does!)*
- Why do insureds need Extra Expense coverage?
- What is "rental value"?
- Does your insured need any coverage for dependent properties? *(Ask some South Florida agents!)*
- What "Duties In The Event of Loss" MUST insureds know?
- What endorsement is a MUST?!

Producers . . .

According to three education surveys conducted by the Insurors, you indicated that (1) there was a need for more advanced technical seminars, and (2) you prefer 1/2-day seminars where possible.

This former full-day seminar has been restructured to address the important BI coverages and worksheet calculations, while limiting your time out of production to only 1/2-day.

According to studies, less than 30% of businesses purchase Business Income coverage, while well over half of all businesses that experience a major loss never reopen their doors.

One explanation, most likely, is that Insureds don't understand time element exposures and/or producers cannot explain the nature and importance of these essential coverages . . . for this reason, probably the majority of BI coverage is written under BOP programs.

This seminar is designed to give you the technical foundation that will enable you to understand, market, and counsel your clients on their Business Income insurance needs, while reducing your E&O exposure.

After

Insurors of Tennessee Advanced Seminar Series

BUSINESS INCOME COVERAGES

An Advanced Half-Day Seminar for Experienced Personnel

1 Titles should be easy to identify—readers should be able to tell at a glance what the writer is trying to convey.

According to surveys conducted by the Insurors of Tennessee last year, (1) you want more advanced technical seminars, and (2) you prefer half-day seminars when possible. Well, we're listening.

This former full-day seminar has been restructured to give you the information you need while limiting your time away from the office to just half a day.

2 Each page should have a beginning, a middle, and an end. Your design should tell readers where to start.

According to recent studies, [illegible] percent of business Business Income [illegible] well over half of [illegible] that experience a [illegible] again reopen their doors.

One likely explanation is that insureds don't understand time element exposures and/or producers cannot explain the nature and importance of these essential coverages. For these reasons, probably the majority of BI coverages are written under BOP programs.

This seminar is designed to give you the technical foundation you need to understand, market, and counsel your clients on their Business Income insurance needs, while at the same time reducing your E&O exposure.

What We'll Cover

- Learn how to to complete the Business Income worksheet, and to calculate coverage limits.
- What are the differences between the 1985, 1988, 1990, 1991 forms, and what are the advantages of the 1991 form for clients?
- When is off-premises power failure coverage needed?
- What time element coverage is not offered by a BOP?
- What "optional coverages" are available?
- When does Business Income coverage stop?
- What is "rental value?"
- Does your insured need any coverage for dependent agents?
- What "Duties in the Event of Loss" must insureds know?
- Which endorsement is a must?

Who Should Attend

This seminar is intended for Principal, Producer, CSR/Claims, and Company Representatives with Intermediate to Advanced Commercial experience.

CE Credit Hours:

Tennessee ---------	4
Georgia ----------	3
CPCU ----------	4
AAI ----------	4

This seminar has been FILED for the above hours.

Calendar of Upcoming Advanced Seminars

Advanced Auto and Garage
11/
11/
11/
11/
11/

4 Watch your typefaces: Too many different fonts on a page make it look unprofessional.

Business Income Coverages
1/15 - Memphis
1/16 - Dyersburg
1/17 - Nashville
1/18 - Chattanooga
1/19 - Knoxville

Commercial Lines Update
2/1 - Tri-Cities
2/2 - Knoxville
2/3 - Chattanooga
3/22 - Jackson
3/23 - Memphis

CISR - ALS (for CISR's only)
3/3 - Tri-Cities
3/4 - Knoxville
3/17 - Memphis
3/18 - Jackson
3/24 - Chattanooga
3/25 - Nashville

CIRS - Agency Operations
4/6 - Knoxville
4/27 - Chattanooga
5/25 - Nashville
6/14 - Memphis

T-S-I
Tennessee School of Insurance

3 If you're thinking about using a table, be sure the information is suited to it. Lists and numbers make better tables than straight text does.

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NEC

Circle 187 on reader service card

COMMUNICATIONS Q & A

Faxes That Know Voice From Data

Q I have a fax-modem on the same line as my telephone. Is there a way to make the fax-modem distinguish between a fax and a voice call? Are there any products that can do this when my modem is off?
Charles Forelle, New York

A Determining the nature of an incoming call is something only sophisticated fax-modems can do. For instance, there are three internal fax-modems in Intel's SatisFaxtion line that can make the distinction: the $269, 2400-bps 200; the $329, 9600-bps 350; and the $399, 14,400-bps 400. However, these fax-modems support only the DCA/Intel Communicating Applications Specification (CAS), a method for communicating with fax software, instead of the industry-standard Service Class 1 or 2. So you'll have to make sure your fax software supports CAS. For more information call Intel at 800/548-4725.

By the time you read this, a number of fax-modems with on-board digital signal processors will have hit the market. They'll be able to distinguish between voice, fax, and data and route calls appropriately or take voice messages.

Watch out for other types of gadgets that claim they can determine the nature of incoming calls. Neither communications software nor black-box–type devices that hook up between the fax and the phone jack can reliably tell the difference between bits and breath.

What Good Is 14,400 bps?

Q I recently bought a 14,400-bps fax-modem to save money on long-distance calls. I was disappointed to see that it usually transmits faxes at 9600 bps or 4800 bps, thanks to the paucity of other 14,400-bps fax devices out there. Did I waste my money?
Albert Zhou, Indianapolis

A Not at all. These days, the price difference between a 9600-bps and a 14,400-bps modem can be as little as $30. And even if you connect at 14,400 bps to just a handful of fax devices, the long-distance savings can pay for the extra speed in just a few months. Say you pay $1.50 in tolls and taxes each time you transmit a three-page fax at 9600 bps. With a 14,400-bps modem, you'll cut your costs by a third with each transmission, which means your modem may well pay for itself after about 60 faxes. What's more, fax-modem technology has been springing ahead so fast that slower models will seem like dinosaurs in another year.

Navigating CompuServe MHS Hubs

Q Our firm recently purchased the Notework 2.0 E-mail system with a Message Handling Service (MHS) hub. I would like to send E-mail to an Internet address using the CompuServe MHS Hub. How should I address it?
Ro Kolakowski, Los Angeles

A CompuServe's Mail Hub allows users of connected company LANs to send E-mail to other company LANs, to CompuServe users, and to the many message services connected to it, including Internet, AT&T Mail, MCI Mail, and SprintMail.

To route a message to an Internet address via the CompuServe MHS Hub, for example, you would enter **MAIL@CSERVE {INTERNET:***username@subdomain.domain***}**, where *username@subdomain.domain* is the recipient's Internet address, as in 'larryg@att.com'. Internet users sending messages via the CompuServe MHS Hub to a company LAN would use *username@workgroup***.MHS.COMPUSERVE.COM**. For more information about using the MHS Hub, type **GO MHS** at any CompuServe prompt.

Update on Password Faux Pas

In October's *Communications* column, we reported that SWFTE International's The Wire transmits users' private MCI Mail passwords to the company along with registration information. SWFTE has corrected this problem, and the current version does not transmit passwords.

SWFTE is offering free upgrades to version 2.24A to all users of The Wire. To receive your upgrade, send the company an MCI message via The Wire by selecting *Help/Swfte Tech Support*.

In our original report, we quoted a SWFTE spokesperson who said that access to users' passwords was granted as part of their contract with MCI Mail. As it turns out, the spokesperson was mistaken. MCI does not allow any outside parties to have access to MCI Mail passwords.

By Judy Heim

Judy Heim is a contributing editor for PC World *and the editor of* Online Investor, *a newsletter about using online services to track and manage investments.* Communications *welcomes your questions.* *See page 12 for contact information.*

USER GROUP TIP

Forcing a Busy Signal

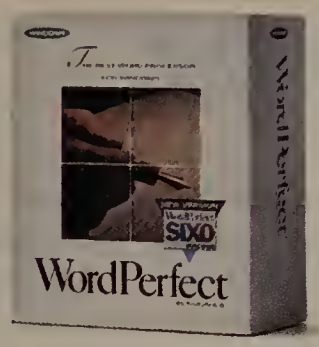
I use a single phone line for voice and data calls, and there's nothing worse than having someone call just as my modem starts dialing, especially if the hapless caller gets a screeching sound as the remote communications software tries to connect.

Luckily, I've found a way to avoid such incidents: With a Hayes-compatible modem, I just start up my remote communications program, enter the interactive mode, and type ATH1 followed by <Enter>. The modem responds with 'OK', and the line then is "off hook," stopping incoming calls and giving callers a busy signal. When I'm ready to start remote communications, I first type ATH0 and <Enter> to hang up. Of course, if you keep the line off hook too long, you'll get a recorded message and an annoying noise as you would with a regular phone. If you want to tie up your line but you don't want to listen to the noise, type ATH1M0 and <Enter> to silence the modem.

John Rusnak
Amateur Computer Group of New Jersey

THE DECISION FOR THE RIGHT SIDE OF YOUR BRAIN.

WordPerfect 6.0
for Windows
The latest version.



THE DECISION FOR THE LEFT SIDE OF YOUR BRAIN.

Lotus 1-2-3
for Windows R.4.0
The latest release.

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- *Compaq Color Monitor*
- *Local Bus Video with 1MB Memory*
- *Preinstalled MS-DOS® 6 & Microsoft® Windows™ 3.1*
- *Compaq Mouse*
- *3-Year Warranty*

The Compaq Total Solution Paq also includes a 2,400-bps Data+Fax Modem that lets you send and receive directly, as well as access CompuServe.†† The Compaq ProLinea 4/33s is backed by our free 3-year warranty.† And a free technical assistance hotline is available every hour of every day.

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Circle 47 on reader service card

HARDWARE Q & A

A Mouse of a Different Color

Q I'm running out of slots and would like to get rid of my Microsoft bus mouse card. Can I convert my bus mouse into a serial mouse? Is there any disadvantage to a serial mouse?
Gloria Rodriguez, San Jose, California

A According to Microsoft, you're out of luck. The company doesn't sell a bus-to-serial mouse converter and knows of no third party that does, so you'll have to buy a new mouse if you want to go serial. To answer your second question, there's no difference in performance between a bus mouse and a serial mouse—you won't even have to change your software installation. The only drawback is that you lose a serial port instead of a slot.

Seven Steps to Drive C: Recovery

Q I'm faxing you this because I'm desperate. When I turned on my PC this morning, it wouldn't boot. So I booted from a floppy, and when I tried to switch to drive C:, I got the message 'Invalid drive specification'. I haven't added any cards or changed anything, and I don't have a recent backup. Is this the end of my hard disk?
Natalie Balfour, Fargo, North Dakota

A Not likely. Everyone encounters a disappearing hard drive at some time, and unless you've had problems with the drive before and ignored them, you have every chance of getting your drive and data back intact. Take a deep breath, try the following steps, and remember the cardinal rule: As soon as you get access to the drive, back up all data immediately. I've listed the easiest fixes for the most likely problems first.

1) Unless you have a SCSI drive or an auto-configuring drive, such as a Hardcard, that bypasses your BIOS, try this. Bring up your system's setup routine. Some BIOS's will display a message that tells you how. If yours doesn't, try <Ctrl>-<Alt>-<Insert>, <Ctrl>-<Alt>-S, <Ctrl>-<Alt>-<Esc>, or simply <Esc> or <Delete> after your system does its memory check. (If none of these works, consult your manual or the manufacturer's tech support.)

On the main setup menu, look for 'Fixed disk 1' or a similar entry. If you see the word 'None' or something equally negative, then you've lost your drive configuration. How? A little battery in the system, which powers a tiny amount of RAM that holds the configuration data, is dying. Change 'None' to the correct drive type, save the configuration, and reboot. (If you don't know the drive type, call tech support. If you lack documentation on the drive, you may need to open up your PC and copy down the drive's model number so a techie can help you. For a full description of how to reenter setup data and change batteries, see "Password: Help!" in last month's column.) Everything should work, but don't turn off your machine until you're ready to change the battery, or you may have to do this every time you fire up your system.

When I turned on my PC today, I got the message, 'Invalid drive specification'. Is this the end of my hard disk?

2) If you have a SCSI drive, I have a question: Installed any new software lately? Some SCSI devices require a line in your CONFIG.SYS file, and software installation routines are notorious for scrambling CONFIG.SYS.

If you don't know whether your drive needs a CONFIG.SYS DEVICE statement or what that statement should be if you need one, check the manual or call the manufacturer. Write that statement down when you get it, then boot from a floppy and swap in a disk containing DOS's text editor. Use the editor to create a new CONFIG.SYS file containing the device statement, save the file, and reboot from the floppy. If this works, open the CONFIG.SYS in drive C:'s root directory, and look for the statement. If it's not there, or if it's jammed on a line with something else, enter the correct DEVICE statement on its own line immediately after any memory managers you may have (such as HIMEM.SYS). Reboot, and remember: Always check CONFIG.SYS after you install software.

3) Leave your system on for an hour. Then reboot and see if it works. If your machine was cold overnight, components inside the drive may have contracted enough so that the read/write heads can't find the boot sector on your drive. As the drive warms up, the components realign themselves into the position they were in when they wrote the data, and everything works.

Unless the climate change was radical, temperature sensitivity often signals that your drive is drifting out of alignment. Back up your data. Then run a nondestructive, low-level format program such as The Norton Utilities' Calibrate or Gibson Research's SpinRite, which can restore data on the drive, including sector information, to its rightful place. If you run a low-level format and still have problems, get a new drive.

4) Try running a hard disk diagnostic program, such as The Norton Utilities' Disk Doctor, from drive A:. Norton and many other utilities can detect a drive when DOS cannot. If the utility detects your hard drive, it may give you an error message and recommended action. If no error messages appear, or you get one stating that drive C: isn't bootable, use a utility to make it bootable. Reboot, and if the drive comes to life, back it up immediately and run a nondestructive, low-level format.

5) Turn off your PC, open it up, and reseat all of the cables—that is, unplug them and plug them in again. Reseating ensures nothing has come loose and scrapes away corrosion that may have accumulated on the contacts. If the data cable (a flat, gray ribbon cable) plugs into the motherboard, remember to

reseat that connector, too. If your drive plugs into a card, reseat the card as well, all the way into the slot. Finally, reseat the power cable, a three-conductor cable running from the power supply to the drive, where it ends in a white plug. The plug should be hard to remove, so make sure you pull on the plug and not the cable, and push hard to plug it all the way back into the drive. Turn on your machine and see if it works. If it doesn't, turn off your PC and leave the cover off for the next step.

6) Turn your PC on again. Put your ear to the drive. Does it make any noise? Usually, you can hear a rising whir or whine as the drive spins up. If you hear nothing, and you have an old drive, you could be a victim of *stiction* (short for static friction), where the heads actually stick to the platter.

There are two ways to cure stiction. First, turn off your PC, disconnect the cables, and remove the drive. Hold the drive firmly in your hand, with the broad, flat, smooth side of the drive resting against your palm. To unstick the heads, twist the entire drive hard and fast in your hand a couple of times along the plane of the drive's platter. Plug the drive back in, and turn your system on. If the drive still won't spin, turn off the system, disconnect the cables again, and try twisting the drive's spindle—if you can get hold of it. Often you'll find it under the drive's circuit board, which is usually safe to remove, as long as you're careful not to put a strain on the short ribbon cable between the circuit board and the drive. The spindle may be slotted for a screwdriver, but most likely you'll have to grab it and twist with a pair of pliers. If you reconnect the drive and it works, back up your data immediately, and buy a replacement drive pronto.

7) Even if you run a diagnostic and can't detect any controller errors, try another interface card—but make sure you try the right one. You should be able to connect any IDE hard disk to any IDE interface board; the same goes for SCSI drives and cards. With ESDI, ST506, and XT-type drives, however, you may need to do some fancy configuring to get card and drive to talk to each other. Contact the drive and card manufacturers for help.

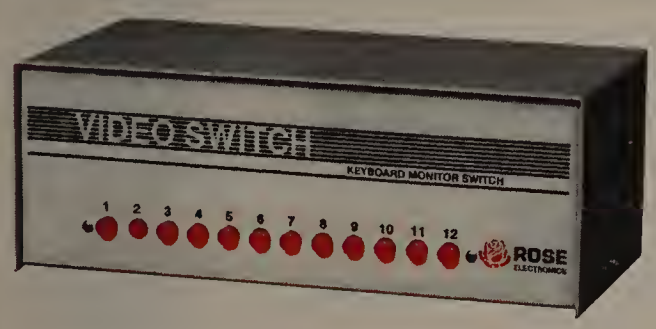
If none of these strategies works and the data on that dead drive is vital, it's time to bring in the professionals. Some argue that you should do this before attempting a low-level format, since low-level formatting with a damaged or misaligned head could trash everything. That's certainly possible, which is why I emphasize that *you must back up as soon as you get the drive running.* If the drive then goes belly up, you can always buy another drive and restore the data to it, which is cheaper than sending the drive to a data recovery service. But when all else fails, those services really can help, especially if they have access to a clean room, where they can open up and physically repair the drive safely, at least to the point at which data can be recovered. Three such services are Group One Electronics (818/993-4575), Ontrack Data Recovery (800/752-1333), and Workman and Associates (818/791-7979).

By Eric Knorr

Eric Knorr is a contributing editor for PC World. Hardware *welcomes your questions.* *See page 12 for contact information.* ■

Your Choice of Keyboard Monitor Switches

Access multiple computers with a single keyboard and monitor to cut equipment costs, save valuable space, and end clutter



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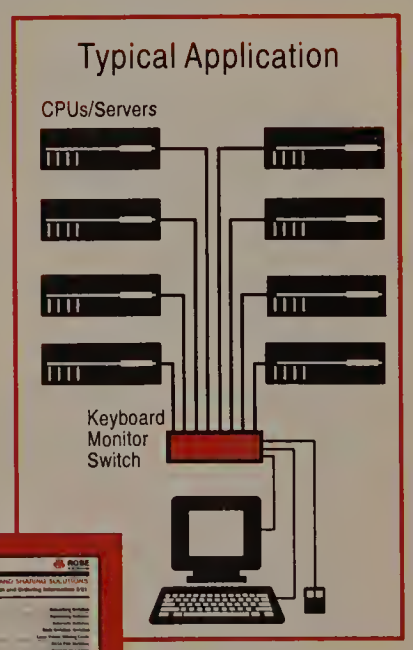

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STAR-DOT-STAR TIPS

Finessing Floppies

If you've accumulated as large a collection of floppies as I have, you'll probably appreciate an easy way to keep track of your ever-growing collection. CATALOG.BAT **[FIGURE 1]** prints directory listings of your floppies that you can keep with the disks. It will even record hidden files.

The batch file uses DOS 6.*x*'s new CHOICE command to ask you which drive you want to catalog (A: or B:). It then gets the volume label and directory from the floppy disk using the command DIR A:\ /S /A /O:N, alphabetizing the files as it does so. Finally, it sends the whole listing to the printer. You can file the catalog page for later reference, either by numbering both the page and the disk or by keeping the page with the disk.

Justin Jordan, Memphis

Editor's note: This is a fast, no-nonsense way of keeping track of what's on your floppies. Best of all, it lets you take a two-fisted approach—you put one floppy in the drive while you're printing the contents of another, clearing away a pile of unmarked disks in no time. I changed Jordan's batch file slightly so in addition to printing, it saves all your floppy listings to a single ASCII file for quick searches.

Create CATALOG.BAT as an ASCII text file, and save it to a directory in your AUTOEXEC.BAT's PATH statement. There's one trick you need to know when entering the file: You can't type the ♀ character, which is ASCII code 12. How you place it in your document depends on what text editor or word processor you use. If you use DOS's EDIT program, type **<Ctrl>-P**, then hold down **<Alt>** as you type **12** on the numeric keyboard. CATALOG.BAT is available on PC World Online.

By the way, this batch file is a good example of DOS 6.*x*'s CHOICE command, which lets you pick one of several options to redirect your batch file. If you haven't upgraded to DOS 6.*x* yet (I haven't), and you have Norton Utilities on hand, you can substitute the Norton Batch Enhancer command **BE ASK "Drive to catalog (Q to Quit)?" ABQ** for the CHOICE command in the listing. If you have more than two floppy drives, it's easy to add additional drive letters; just be sure to adjust the IF ERRORLEVEL statements to reflect the new choices.

```
@ECHO OFF
CLS
ECHO.

:REPEAT
REM Ask for action
CHOICE /C:ABQ /N Drive to catalog (Q to Quit)?
ECHO.
IF ERRORLEVEL 3 GOTO END
IF ERRORLEVEL 2 GOTO DRIVEB
IF ERRORLEVEL 1 GOTO DRIVEA

:DRIVEA
SET CATDRIVE=A
GOTO CATALOG

:DRIVEB
SET CATDRIVE=B
GOTO CATALOG

:CATALOG
REM Catalog drive %CATDRIVE%
CLS
ECHO Now cataloging drive %CATDRIVE%...
ECHO Catalog for drive %CATDRIVE%: > TEMP.TXT
ECHO. >> TEMP.TXT
DIR %CATDRIVE%:\ /S /A /O:N >> TEMP.TXT
TYPE TEMP.TXT > PRN
ECHO ♀ > PRN
TYPE TEMP.TXT >> FLOPPIES.TXT
ECHO Cataloging of drive %CATDRIVE% complete!
GOTO REPEAT

:END
```

FIGURE 1: CATALOG YOUR FLOPPIES with this handy batch file.

Many Marquees

If you read "75 Tips for Windows and DOS," you may remember Rodney Bayron's tip about setting up a screen saver so you can launch it from Program Manager ["Instant Screen Saver," July 1993]. I've discovered a variation on his trick that allows you to set up multiple Marquee screen savers, each with a different message.

The original tip was based on the fact that a screen saver, even though it has the extension SCR, is actually a complete program. If you put the extension **SCR** at the end of your WIN.INI file's Programs= line, you can launch any Windows screen saver directly.

For the easiest launching, change your WIN.INI, then drag an SCR file from File Manager into Program Manager. With the file's icon highlighted in Program Manager, press **<Alt>-<Enter>**, and add the parameter **/S** to the end of what's already in the command-line text box. You can then start that particular screen saver as easily as any application. You can place as many screen savers as you like in Program Manager and still set up another—via Control Panel—to actually save your screen.

Now for my addition to that tip: Since I have several messages for different purposes—to let people know when I'm in a meeting, out to lunch, and so on—I need more than one Marquee. Here's how to create several preconfigured versions of this screen saver.

First, make a copy of the file SSMARQUE.SCR (the Marquee screen saver) with a new name but in the same directory. The name must start with SS, be a full eight characters long, and have the extension SCR, as in **SSMARQU2.SCR**. Open the copied screen saver with Windows Write and select *No Conversion* in the resulting dialog box. Once you have the file in Write,

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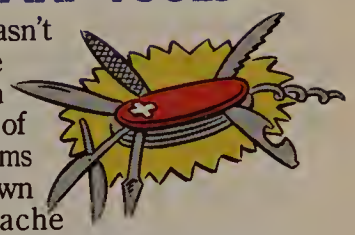
SCOREBOARD

Comparing memory managers	Helix Software Netroom 3.02	Qualitas Inc. 386Max 7.0	Quartordeck Office Systems QEMM 7.01
PC WEEK LABS Overall score	4.5	3.6	4.0
Ability to reclaim memory below 1M byte (60%)	4.5	3.5	4.0
Ease of setup and configuration (25%)	4.0	3.5	3.5
Variety of memory APIs (15%)	5.0	4.0	4.5

Ratings Legend: 1 = Poor, 2 = Unremarkable, 3 = Meets Expectations, 4 = Better Than Expected, 5 = Outstanding

PC WEEK – July 26, 1993

SOME PRETTY SHARP TOOLS



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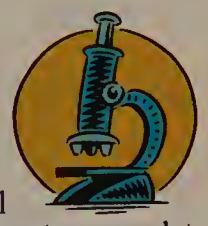

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- Special network loaders
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SYSTEM REQUIREMENTS: Netroom operates with any 386 or 486 system with at least 1Mb of RAM. Limited support for 286/Neat systems is provided but does not include "Cloaking". For Windows support Netroom requires Windows 3.1 or later (WFW is supported). Microsoft Windows is a trademark of Microsoft Corp.

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use *Find•Replace* to replace all instances of **SSMARQUE** with **SSMARQU2** (or whatever file name you chose). With the Replace dialog box still up, replace all instances of **MARQUEE** with **MARQUE2** (the name can be anything you like, as long as it's seven characters long). Save the file and exit Write.

Now if you enter the Control Panel's Desktop option, you'll notice MARQUE2 in the list of screen savers. You can configure this choice independently of the original Marquee, so you can use one to display your pager number and another to say that you're in an important meeting.

James R. Erickson, Coon Rapids, Minnesota

Editor's note: This tip, like a few others that have appeared in *Star-Dot-Star,* reveals a use of Windows Write for which it was probably never intended: as a binary editor that can patch applications. The 'No Conversion' option allows you to change the text within any binary file—as long as your new text is exactly the same length as what it's replacing.

No Boots Indoors, Please

I operate a cluster of PCs whose screens and keyboards are available for students and the general public. For security reasons, we keep the systems themselves locked up behind a counter and want to make sure no one can reboot the machines from their keyboards.

I've designed a small TSR called NOBOOT.COM that protects against keyboard reboots. The program works by monitoring the keyboard and preventing the BIOS from seeing the <Ctrl>-<Alt>-<Delete> sequence. Once you install this TSR, the only ways to reboot the machine are by turning it off, hitting the reset switch, or running a program that bypasses the keyboard and forces the machine to restart. This program can also prevent users from rebooting during critical operations such as database transactions and hard disk defragmentation.

Brett Wreely, Pocolo, Colorado

Editor's note: To create NOBOOT.COM, copy **FIGURE 2** to a file called NOBOOT-.SCR, then type **DEBUG < NOBOOT.SCR** at the DOS prompt. NOBOOT.COM will appear in the current directory. If you're on PC World Online, you can save yourself the trouble of typing the DEBUG script and download NOBOOT.COM ready-made. Note that for security reasons, this TSR can't be uninstalled; once you load it—from AUTOEXEC.BAT or otherwise—you will not be able to reboot from the keyboard.

Get a Temp

If you haven't already done so, it's a good idea to create a directory on your hard disk for temporary files and to tell DOS and Windows where it is. DOS and Windows automatically put their files on the boot drive, but you may have good reasons to use a different drive and directory. For instance, you may want to place your temporary files on a secondary hard drive partition to protect your main one, or on a RAM disk to improve performance. Tell DOS and Windows where to find your temporary directory by including the command **SET TEMP=*d*:\TEMP** (*d* represents the drive where you want this directory located) in your AUTOEXEC.BAT file.

Why is choosing your own TEMP directory location so important? Both DOS and Windows have a tendency to use up a lot of disk space in that directory—the DOSSHELL task switcher stores 640K for every background task—and your C: drive can quickly run out of space. By placing TEMP on another drive, you can ensure that DOS and Windows don't put their garbage

```
N noboot.com
E100 EB 6B 90 00 00 00 00 50 1E B8 40 00 8E D8 A0 17
E110 00 24 0C 3C 0C 75 0D E4 60 24 7F 3C 53 75 05 80
E120 26 17 00 FB 1F 58 2E FF 2E 03 01 43 74 72 6C 2D
E130 41 6C 74 2D 44 65 6C 20 44 65 66 65 61 74 20 49
E140 6E 73 74 61 6C 6C 65 64 0D 0A 43 6F 70 79 72 69
E150 67 68 74 20 28 43 29 20 31 39 39 33 20 42 72 65
E160 74 74 20 57 72 65 65 6C 65 79 0D 0A 24 B8 09 35
E170 CD 21 2E 89 1E 03 01 2E 8C 06 05 01 BA 07 01 B4
E180 25 CD 21 BA 2B 01 B4 09 CD 21 CD 27
RCX
8C
W
Q
```

FIGURE 2: TO BLOCK OUT KEYBOARD REBOOTS, use this hex code to create a protective TSR for your AUTOEXEC.BAT file.

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FILE COMPRESSION: PKZIP 2.0

PKZip compresses single files and groups of files into container, or ZIP, files. Compressed files use less disk space and are easier to transfer by floppy or modem. Use PKZip's two major commands, **PKZIP** and **PKUNZIP**, to compress (zip) and uncompress (unzip) files, manage ZIP files, and control how compression operates. Enter the commands at the DOS prompt.

Note: Keys to press are shown here in **boldface**. *Italic* indicates a variable entry you must provide (for example, *d:* means specify a drive). Brackets surround an optional entry (do not type the brackets). A bullet (•) links menu and option names in a series. Ellipses (...) indicate parameters that may be used more than once.

COMPRESSING FILES

To compress files, the command PKZIP must be followed by a space and the name of the ZIP file you want to create. You can also include multiple, case-sensitive options (each indicated by a leading hyphen or @ sign) and other parameters to control PKZIP. To create a ZIP file in a directory other than the default, include the drive and/or directory path before the ZIP file's name. For example, you can indicate which files or groups of files you want, and don't want, zipped or tell PKZIP to make your ZIP file as small as possible. A typical command looks like: **PKZIP A:ZIPFILE C:\UTL\PROG.COM C:\UTL*.DAT -ex -z -ac -&**

Note: By default, PKZIP copies the files it is compressing into a ZIP file. To move the files into a ZIP file rather than copy them, add the **-m** parameter to the end of the command line. Also, you can get help by typing **PKZIP -h**.

Fold Here

Task	Parameter(s)
Zip specific file(s)	[*d:*][*path*\]*filename.ext*...
Zip all files in current directory	Omit specifying source files
Zip all files in specific directory(s)	*d:**path**.*...
Zip directory's files having specific extension(s)	[*d:*][*path*\]*.*ext*...
Zip files listed in ASCII text file	@[*d:*][*path*\]*textfile.ext*
Exclude specific file(s) from being zipped	**-x**[*d:*][*path*\]*filename.ext*...
Exclude files with specific extension(s) from being zipped	**-x**[*d:*][*path*\]*.*ext*...
Use maximum compression (slow)	**-ex**
Use normal compression and speed (default)	**-en**
Zip fast (less compression than normal)	**-ef**
Zip super fast (least compression)	**-es**
Zip without compression	**-e0**
Include only files dated today	**-t**
Include only files dated on or after specific date	**-t***mmddyy*
Include only files dated before specific date	**-T***mmddyy*
Include directory's and its subdirectories' files	**-rP**
Remove hidden/read-only/system file attribute from zipped files	**-]h/-]r/-]s**
Include hidden/system files	**-wh/-ws**
Span floppies, if ZIP file larger than target	**-&**
Zip current drive and all subdirectories, spanning floppy disks if necessary	**-&s**
Store volume label of drive *d:* in ZIP file	**-$***d*
Create 127-character ZIP file comment	**-z**
Create 59-character comment for each file being zipped	**-ac**
Encrypt and password-protect ZIP file	**-s***password*

MODIFYING COMPRESSED FILES

To modify a ZIP file, the command PKZIP must be followed by a space, the name of the ZIP file you want to change, case-sensitive options, and sometimes other parameters. To work with a ZIP file in a directory other than the default, include the drive and/or directory path before the ZIP file's name.

Note: The last three entries are commands, not PKZIP parameters.

Task	Parameter(s)
Update ZIP file if specific file(s) is newer than file of same name in ZIP file (or is not currently in ZIP file)	**-u** [*d:*][*path*\]*filename.ext*...
Delete specific file(s) from ZIP file	**-d** [*d:*][*path*\]*filename.ext*...
Delete files having specific extension	**-d** [*d:*][*path*\]*.*ext*...
Keep ZIP file's date when adding or deleting its files	**-k**
Set date of ZIP file to date of newest file within it	**-o**
Modify 127-character ZIP file comment	**-z**
Add or modify 59-character comment for each file in ZIP file	**-c**
Display actual size, compressed size, ratio, date, time, attributes, name, and comment of each file in name order, pausing for each screenful	**-vncm**

Fold Here

Turn ZIP file into self-unzipping (EXE) file	**ZIP2EXE** [*d:*][*path*\]*zipfile.ext*
Return self-unzipping file to normal ZIP file	**ZIP2EXE -e** [*d:*][*path*\]*filename*
Fix corrupt ZIP file	**PKZIPFIX**

UNCOMPRESSING FILES

To uncompress a ZIP file's files, the PKUNZIP command must be followed by a space and the name of the ZIP file. Case-sensitive options and other parameters control PKUNZIP. To uncompress a ZIP file that is in a directory other than the default, include the drive and/or directory path before the ZIP file's name. A typical command looks like: **PKUNZIP A:ZIPFILE C:\UTIL -d -Jhrs**

Note: You can get help by typing **PKUNZIP -h**.

Task	Parameter(s)
Unzip files into specific directory	[*d:*][*path*]
Unzip files into default directory	Omit specifying directory
Recreate zipped files' directory structure below default or specific directory	**-d** [*d:*][*path*]
Unzip password-protected ZIP file	**-s***password*
Unzip files in order of name/date/extension	**-en/-ed/-ee**
Unzip files in reverse order of name/date/extension	**-ern/-erd/-ere**
Unzip only files that are newer than those (or are not located) in target directory	**-n**
Print specific zipped ASCII file(s) on LPT/COM printer	*filename.ext*... **-p***x***/-pc***x*
Print specific zipped binary file(s) on LPT/COM printer	*filename.ext*... **-pb***x***/-pbc***x*
Test unzipping of ZIP file	**-t**
Display file, pausing for each screenful	*filename.ext* **-cm**
Retain all attributes of files being unzipped	**-Jhrs**
Label target disk *d:* if label was stored in ZIP file	**-$** *d:*

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DISK COMPRESSION: DOUBLESPACE AND STACKER 3.1

Disk compression programs free disk space by shrinking the files you store in the virtual drive(s) the programs create. The virtual, compressed drive is actually a read-only, system, and hidden volume file on an uncompressed host drive. A volume file is mounted when it is assigned its own drive letter. The compression ratio compares the actual amount of disk space needed to store an uncompressed file against the estimated amount needed to store it compressed.

STACKER 3.1 FOR DOS

To perform a task, enter the appropriate command at the DOS prompt or enter the command **STAC** and use that program's menus.

Note: Compressed removable media can be used in systems without Stacker.

Task	DOS command	STAC menu
Compress hard disk	**SETUP**, **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart	**H**ard Disk • **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart
Create compressed drive from host's free space (sss.s=MB to allocate)	**CREATE** *d*: **/S=**sss.s	**H**ard Disk • **R**estart, select drive, **C**ontinue • **F**ree Space • **u**se, type amount, **S**tack • **R**estart
Set estimated compression (e.g., 2.0)	**SDEFRAG /GL** *d*:, set ratio, **<Enter>** • **P**erform changes on Stacker drive	**E**xpected Compression, select drive, set ratio, **<Enter>** • **P**erform changes on Stacker drive
Increase compressed drive's size	**SDEFRAG /GP** *d*:, **I**ncrease Stacker drive size, set size, **<Enter>** • **P**erform changes on Stacker drive	Stacker Drive Size, select drive, **I**ncrease Stacker drive size, set size, **<Enter>** • **P**erform changes on Stacker drive
Decrease compressed drive's size	**SDEFRAG /GP** *d*:, **M**ore uncompressed space available, *key*, set size, **<Enter>** • **P**erform changes on Stacker drive	Stacker Drive Size, select drive, **M**ore uncompressed space available, *key*, set size, **<Enter>** • **P**erform changes on Stacker drive
Tune compression versus speed	**TUNER**, select option, **C**ontinue • OK	**S**tacker Tuner, select option, **C**ontinue • OK
Uncompress drive, copying files to host	**UNSTACK** [*d*:]	**U**nstack, select drive, Remove Stacker drive • Yes—proceed • **<Enter>**
Delete drive and its files	**REMOVDRV** *d*:, Remove Stacker Drive, Yes	n/a
Mount/unmount floppy drive	**STACKER** *d*/–*d*	n/a
Get drive information	**REPORT** [*d*:]	**C**ompression Report, select drive
Defragment drive quickly/fully/fully with recompression	**SDEFRAG** [*d*:] **/Q** or **/F** or **/R**	Stacker **O**ptimizer, select drive, **Q**uick Optimize/**F**ull Optimize/**R**estack
Check and fix	**CHECK** [*d*:] **/F**	Drive **I**ntegrity, select drive

STACKER 3.1 FOR WINDOWS

Compress existing drive	Open Stacker Setup, OK • **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart
Create compressed drive from free space of host	Open Stacker Setup, OK • **R**estart, select drive, **C**ontinue • **F**ree Space • **u**se, type free space, **S**tack • **R**estart
Run Stackometer to view drive's compression ratio, usage, and fragmentation	Switch to Program Manager, double-click Stackometer icon, **S**ettings • **S**elect Drive, select drive, OK

STACKER 3.1 FOR WINDOWS (continued)

Update Stackometer gauges*	**S**ettings • **R**efresh
Set drive's compression ratio*	**T**ools • **S**et Expected Compression • OK, *key*, type new ratio, **<Enter>** • **P**erform changes on Stacker drive • **<Enter>**
Defragment drive quickly/fully/fully with recompression*	**T**ools • **Q**uick Optimize/**F**ull Optimize/Full Optimize and **R**estack • OK • **C**ontinue • **<Enter>**
Tune compression versus speed*	**T**ools • **T**une Stacker, select option, OK; or run Stacker Tuner from Program Manager
Get drive information	Switch to Program Manager, **F**ile • **R**un, **C:\STACKER\REPORT**, OK
View selected files'/drive's compression ratio in File Manager	**S**tacker • **F**ile Info/**D**isk Info

*Run Stackometer to access the Settings and Tools menus.

MS-DOS 6.0 AND 6.2 DOUBLESPACE

To perform a task, type **DBLSPACE** and then either type a space and the appropriate command line switch or press **<Enter>** and use the program's menu.

Note: DoubleSpace doesn't run in Windows. In the DOS 6.0 version, you must mount a compressed floppy disk before you can use it. DoubleSpace doesn't compress 360K disks.

Fold Here

Task	DOS command switch	DBLSPACE menu
Compress existing drive *d1*: (specify host's drive letter *d2*: and *size* in MB)	**/COM[PRESS]** *d1*: [**/NEW[DRIVE]=***d2*:] [**/RES[ERVE]=***size*]	**C**ompress • **E**xisting Drive, select drive, select host's free space and drive letter, Continue • **C**
Create compressed drive *d2*: from free space of host *d1*:, reserving *size* in MB of free space on host	**/CR[EATE]** *d1*: [**/N[EWDRIVE]=***d2*:] [**/RE[SERVE]=***size*]	**C**ompress • **C**reate New Drive, select host, select host's free space and new drive's compression ratio and letter, Continue • **C**
Set estimated compression (e.g., 2.0)	**/RA[TIO]**[=*r.r*] [*d*: or **/ALL**]	**D**rive • Change **R**atio, enter ratio, OK
Uncompress drive*	**/UNCOMPRESS** *d*:	**T**ools • **U**ncompress • **Y**es
Get drive information	[**/INFO**] *d*:	**D**rive • **I**nfo
List local drives	**/L[IST]**	Start command menu
Set size of compressed drive *d*: (*size* is MB used on host)	**/SI[ZE]**[=*size*] *d*: (omit =*size* to minimize size of compressed drive)	**D**rive • Change **S**ize, enter amount to leave free on host, OK
Limit drive letters DoubleSpace can use*	**/LASTDRIVE=***d*	**T**ools • **O**ptions • *d* • OK
Turn removable-disk automounting on/off*	**/AUTOMOUNT=0/1**	**T**ools • **O**ptions • Enable automounting
Turn detection of data, code corruption on/off*	**/DOUBLEGUARD= 0/1**	**T**ools • **O**ptions • Enable DoubleGuard safety checking
Mount DBLSPACE.*nnn* as drive *d*:	**/MO[UNT]**[=*nnn*] *d*:	**D**rive • **M**ount • OK
Unmount drive	**/U[NMOUNT]** [*d*:]	**D**rive • **U**nmount • OK
Format drive	**/F[ORMAT]** *d*:, **Y**	**D**rive • **F**ormat • OK • **Y**es
Delete drive	**/DEL[ETE]** *d*:; **Y**	**D**rive • **D**elete • OK
Defragment drive	**/DEF[RAGMENT]** [*d*:]	**T**ools • **D**efragment • OK • **Y**es
Check (and fix) drive	**/CHKDSK** [**/F**] [*d*:]	**T**ools • **C**hkdsk • **C**heck/**F**ix

*Available only in MS-DOS 6.2.

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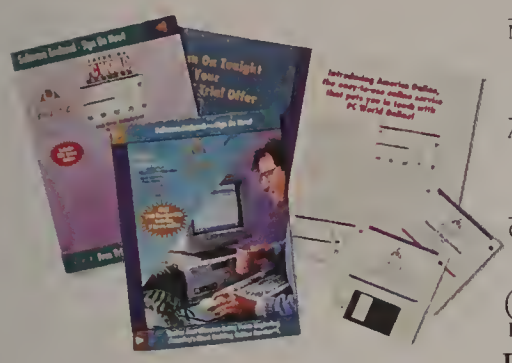

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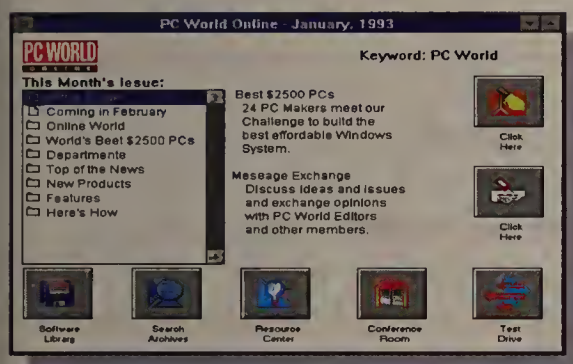

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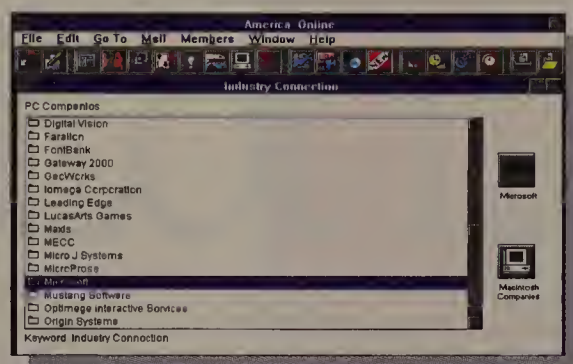

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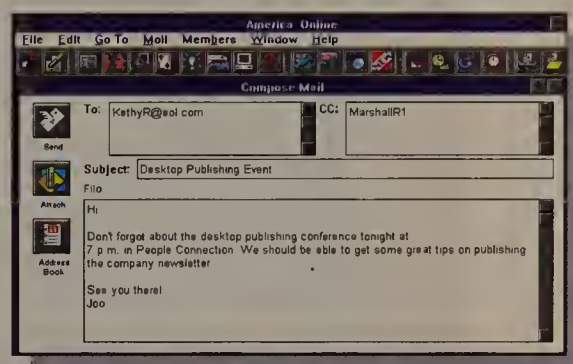

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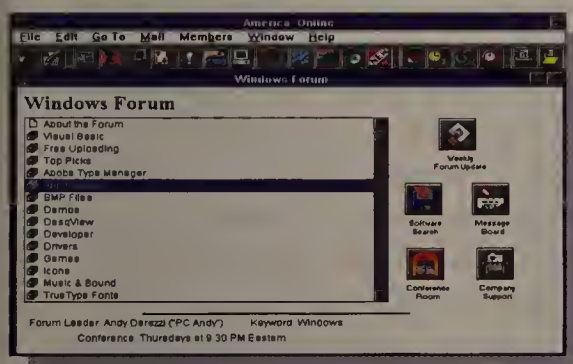

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among your good data. Likewise, many compilers and other applications create temporary files, and a SET TEMP command will give you explicit control over the locations of these files.

William H. Perry Jr.,
Clifton Forge, Virginia

Editor's note: I almost dismissed this tip as unimportant until last week, when a telephone support technician asked me to help track down a bug by booting from a "clean" AUTOEXEC.BAT file. Naturally, because the empty AUTOEXEC.BAT didn't set a TEMP variable, Windows put its temporary files on my C: drive, using up most of the remaining space and causing even more errors than usual. Things calmed down once I had typed in the command SET TEMP=E:\TEMP and steered Windows to a less crowded drive.

If you want to send your temporary files to a RAM disk, you should still create a TEMP directory on it. Placing your temporary files in a drive's root directory—even if those files are the only ones on the drive—can cause problems since there are limits to how many files can go into a root directory.

Mimeless Mines

Windows 3.1's Mine Sweeper game is normally silent. But you can turn on its hidden sound feature by editing the file WINMINE.INI (which appears in your WINDOWS directory after you've played the game and set the options). Simply add the line **Sound=3** at the top of the file using Notepad or any other text editor. After you save the file, the next time you run Mine Sweeper you'll get musical effects through the PC speaker when you win or lose.

John Hankel,
Portland, Oregon

Editor's note: If you're using the Sound Driver for PC Speaker (see "The World's Cheapest Sound Card," *Star-Dot-Star*, December 1993), Mine Sweeper may remain silent. However, if you're not using a sound driver, or you're using one for an actual sound card, Mine Sweeper will play its music on your internal speaker.

By Brett Glass

Brett Glass is a contributing editor for PC World. Star-Dot-Star *welcomes your tips, macros, batch files, and short programs. See page 12 for contact information.*

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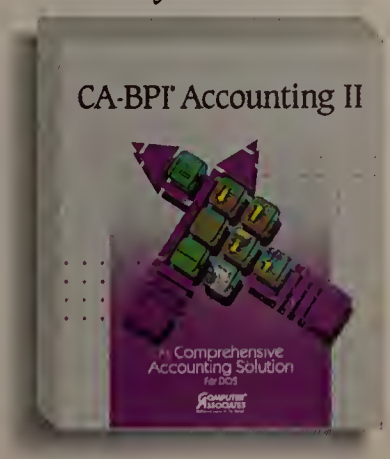

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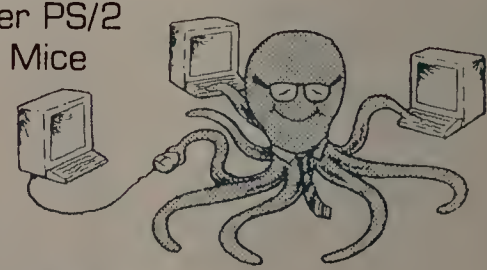

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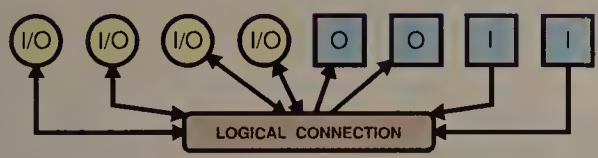

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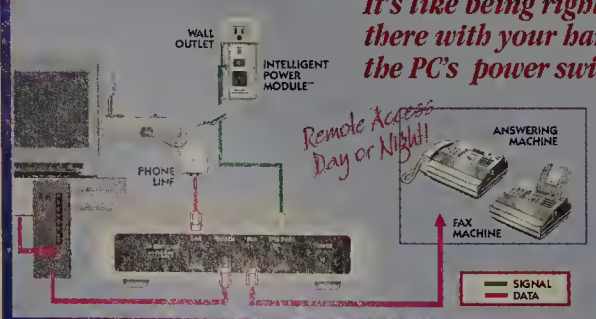

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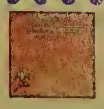

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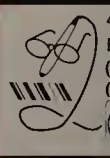

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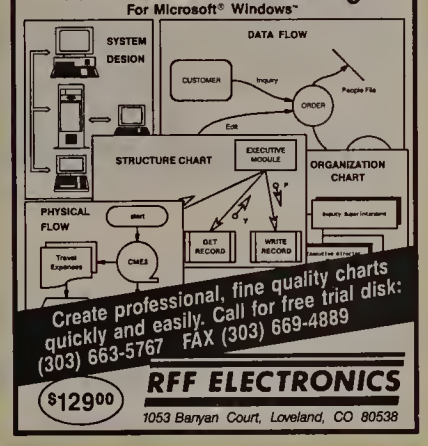

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FACT: 84% of PC WORLD'S employed subscribers are managers

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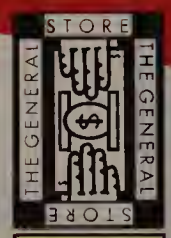

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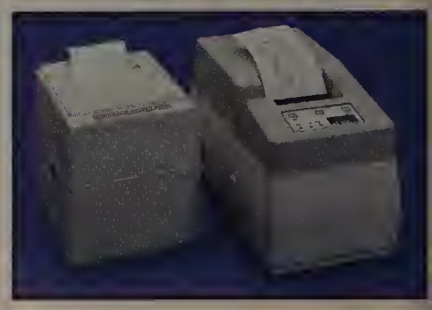

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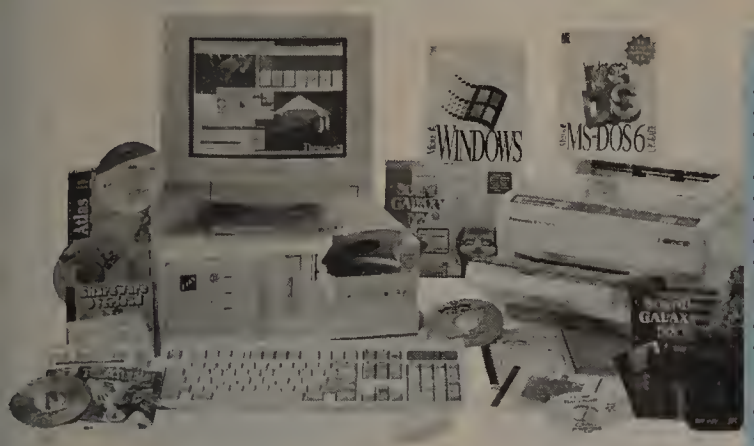

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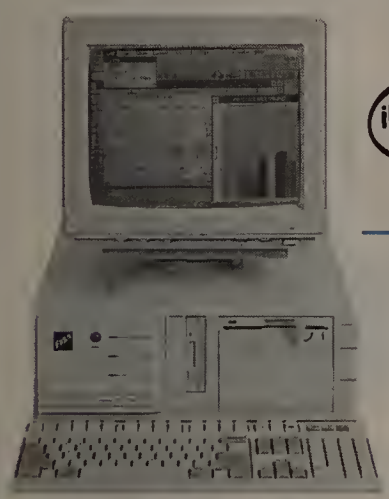

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486DX	33 MHz	120 MB	$1579
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486SX	25 MHz	245 MB	$1559
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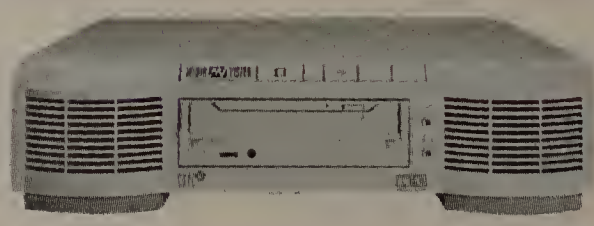

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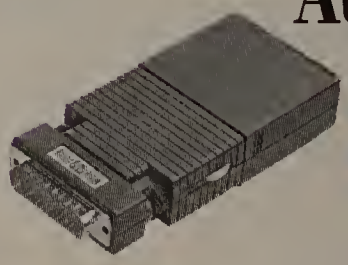

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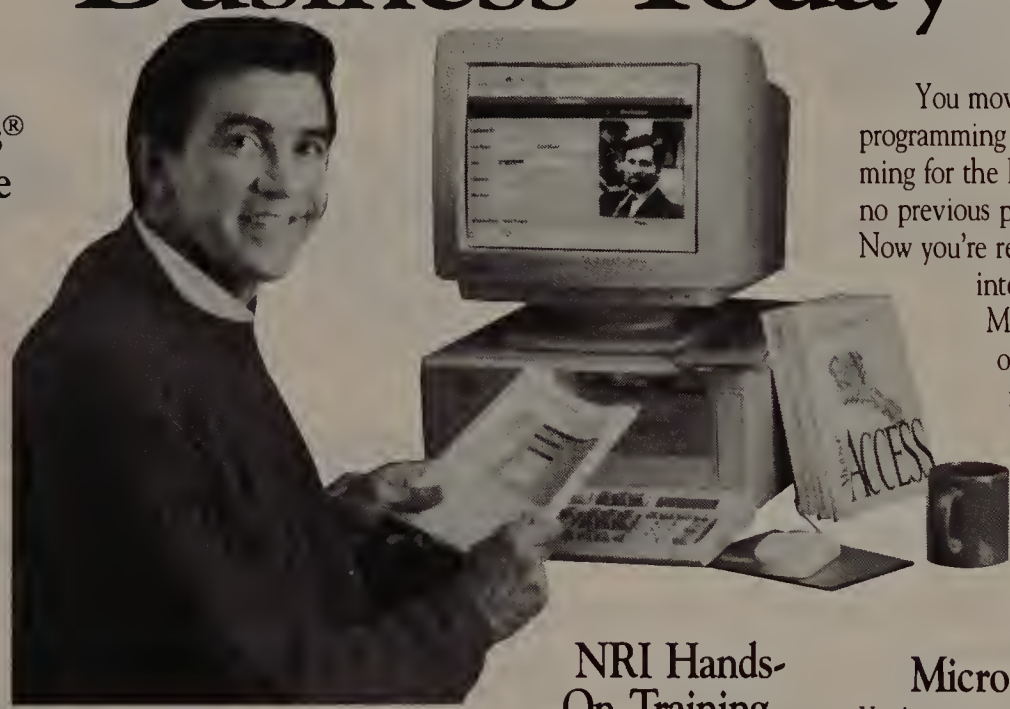

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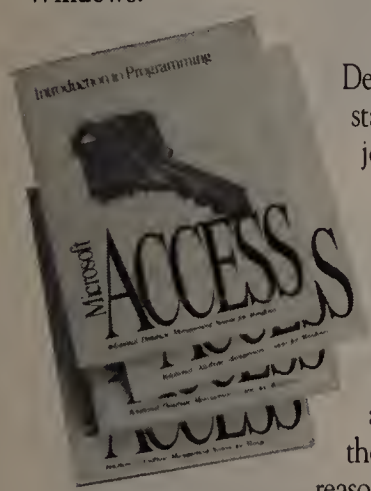

It's a fact: Labor Department statistics predict jobs for those who are in-the-know about database management systems will grow much faster than average through the year 2005. The reason is clear — with a centralized database of information that can be accessed by multiple users simultaneously, companies can now rely on the computer to transact and track business with increased efficiency, accuracy, and ease.

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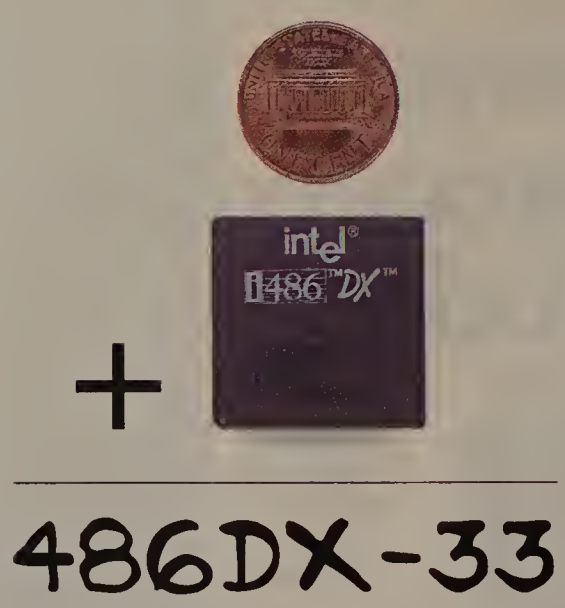

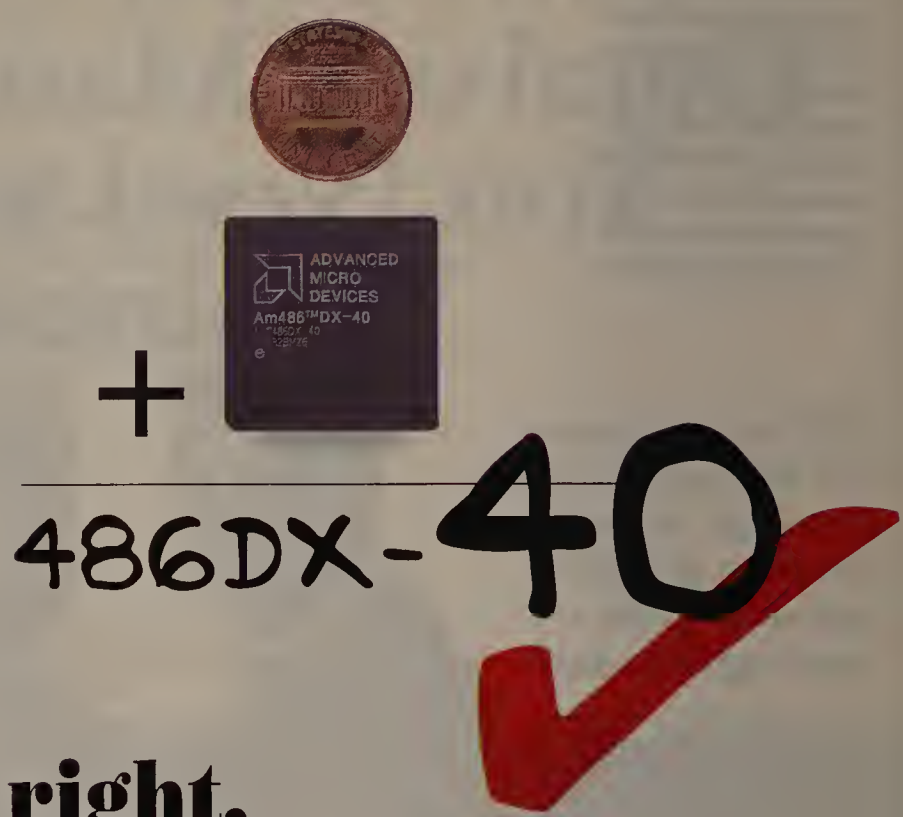

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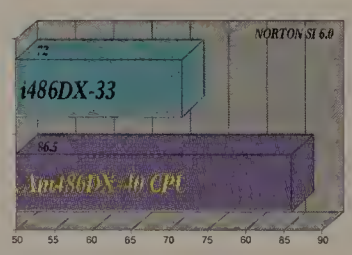

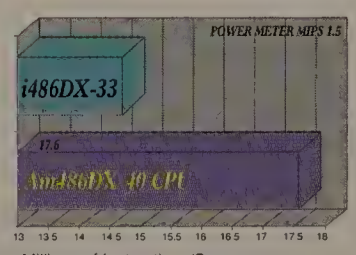

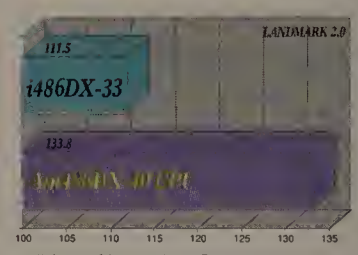

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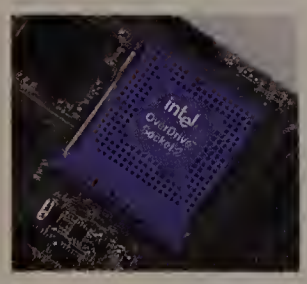

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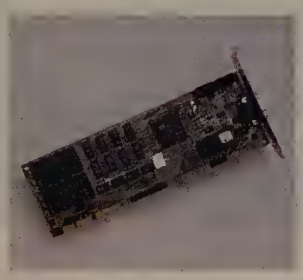

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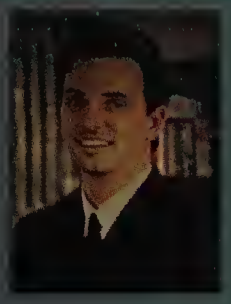

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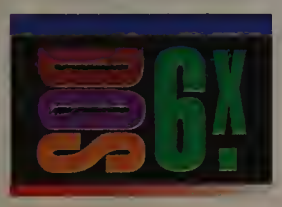

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LTE 286
1MB KIT 117081001
2MB KIT 117081002
4MB KIT 117081003
LTE 386S/20
4MB C-C 121125002
LTE LITE 25, 20
2MB C-C 129769001
4MB C-C 129769002
8MB C-C 129769003
16MB C-C N/A
SLT/286
1MB MOD 110235001
4MB MOD 110237001
SLT 386S/20
4MB MOD 118305001
PORTABLE III
2MB KIT 187332001
INTERFACE 107608001
EXP BOARD 107811001
PORTABLE 386
1MB KIT 107651001
INTERFACE 107707001
4MB E-C 107653001
4MB ADM 107654001
PORTABLE 486C
2MB MOD 118689001
4MB MOD 118690001
8MB MOD 128877001
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0-18MB E-C N/A
DESKPRO 286E
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0-16MB E-C N/A
DESKPRO 386-1S
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1MB E-C 108069001
2MB E-C 108069-71-001
4MB E-C 108070001
8MB E-C 108070-72-001
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4MB E-C 113634001
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8MB MOD 116561001
32MB MOD 116568001
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4MB MOD 118690001
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2MB MOD 141683-001
4MB MOD 141684-001
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4MB MOD 118690001
8MB MOD 128877001
8 SOCK-EC 129180001
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CONTURA 4/25
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16MB MOD 146522001
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2NBN MOD C2321A
4MB MOD C2322A
8MB MOD D2152A
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4MB E-C H334458
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2-4MB E-C H334758
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8MB MOD N.A
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4MB KIT 500510008
BRAVO 486/25, 4-23
2MB KIT 500718004
8MB KIT 500780001
BRAVO 3-25S
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4MB MOD 500987002
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16MB MOD 500987004
32MB KIT 500887005
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PREMIUM 386/33TE, 486/33TE
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2MB KIT 500780005
4MB MOD 500780004
8MB KIT 500780001
0-32MB E-C 500810001
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8MB KIT 500891002
PREMIUM 386
4MB 500510004
POWER PREMIUM 3/33, 4/33 & 4/500
2MB KIT 500780005
8MB KIT 500780001
PREMIUM WKST 286, 386SX
2MB KIT 500510002
4MB KIT 500510008
PREMIUM 386/16, C
4MB KIT 500510008
PREMIUM SE 4/33
2MB KIT 500780005
8MB KIT 500780001
PREMIUM SE 4/50
16MB KIT 500820001
32MB KIT 500828002
PREMMIA
4MB 501159001
8MB 501569002
16MB 501159003
32MB 501150004
MANHATTAN SMP
16MB 501143001
ADVANTAGE PLUS 486DX33
DX250 · DX296
4MB 500510008
8MB 500824001
AST POWER EXEC 4/25SL
4MB NA

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4MB MOD PC4722
8MB MOD PC4723
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2MB MOD PC2126
4MB MOD PC2122
PROSPEED 386
2MB MOD PC3121
8MB MOD PC3122
PROSPEED 386SX
1MB MOD PC2121
2MB MOD PC2126
4MB MOD PC2122
PROSPEED 386SX/20
1MB MOD PC4321
4MB MOD PC4322
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1MB MOD DP4106204
4MB MOD DP4106205
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2MB E-C APCH751X
8MB E-C APCH753-754
POWERMATE PORTABLE PLUS
1-3MB E-C APCH750J
2-3MB E-C N/A
3MB E-C N/A
POWERMATE 386/16, /20
4-16MB E-C N/A
8-16MB E-C N/A
POWERMATE SS
2MB E-C APCH855
4-8MB E-C APCH853
8MB EC N/A
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4-8MB E-C APC852E
8MB E-C N/A
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2MB XIT N/A
POWERMATE SX/20
2MB CPU MODULE DP4108101
2-8MB E-C DP4108102
2MB KIT N/A
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2MB KIT DP4108103
6MB KIT DP4102101
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1-3MB E-C APCH250K
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16MB MOD DP4106206
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2MB KIT DP4108103
8MB KIT DP4102101
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486DX-50-256K CACHE W/CPU	749
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486DX-33 128K CACHE	537
486DX-50 256K CACHE	740
486DX-33 8-ISA, 2-VESA 256K CACHE	612
486DX2-66 8-ISA, 2-VESA 256K CACHE	894
OCEAN	
JAGUAR 386DX-40 128K	139
HIPPO 486DX-33 ISA 256K "Dynamic Cache"	448
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486DX-33 VESA 256K	469
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386DX-40 128K Cache	159
486DX-33 ISA 128K Cache	429
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486DX2-66 6-EISA 2-ISA 1 Meg Cache	1306
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486DX-33 EISA 256K	789
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486DX2-50 ISA 256K	699
486DX2-66 3-VESA 256K	769
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MX-30 486DX-33 VESA 256K	699
MX-30 486DX2-50 VESA 256K	889
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486DX2-66 EISA/VESA 256K MULTI I/D	1299
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8MB C-C PCPA2002U
T1000XE
1MB C-C PCPA8311U
2MB C-C PCPA8312U
T2000
1MB C-C PC18PA8316U
2MB C-C PC18PA8317U
4MB C-C PC1XPA8314U
8MB C-C PC1XPA8315U
T2000SX
4MB C-C PC14PA8314U
8MB C-C PC14PA8315U
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2MB C-C PCPA2000U
4MB C-C PCPA2001U
8MB C-C PCPA2002U
T3300SL
2MB C-C PCPA2006U
4MB C-C PCPA2007U
6MB C-C PCPA2008U
8MB C-C PCPA2009U
16MB C-C PCPA2010U
T4400SX, T4400SXC, T6400-C
2MB C-C PCPA2003U
4MB C-C PCPA2004U
8MB C-C PCPA2005U
16MB C-C PCPA2010U
32MB C-C N/A
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3MB MOD PC6PA7137U
T3200SX
2MB KIT PC12PA8307U
4MB KIT PC12PA8309U
T3200SXC
2MB KIT PC19PA8318U
4MB KIT PC19PA8319U
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170MB ELS170A	17MS	3.5X1"	CALL
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127MB ELS127S	17MS	3.5X1"	CALL
170MB ELS170S	17MS	3.5X1"	229
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FUJITSU

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CAPACITY M/N	SPEED	SIZE	PRICE
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SCSI			
520MB M2624FA	11MS	3.5"	659
1.2GB M2694SA	10MS	3.5"	999
1.2GB M2266SA	14MS	FH	1079
2.0GB M2652SA	11MS	FH	1749
2.4GB M2654SA	12MS	FH	1799

Maxtor

FACTORY NEW – FULL WARRANTY

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IDE			
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213MB 7213A	15MS	3.5X1"	210
245MB 7245A	15MS	3.5"	225
345MB 7345A	15MS	3.5"	289
540MB 7540A	12MS	3.5"	769
SCSI			
130MB 7120S	15MS	3.5X1"	195
213MB 7213S	15MS	3.5X1"	249
245MB 7245S	15MS		265
345MB 7345S SCSI-2	12MS	3.5"	365
540MB MAGIK540SL	6MS	3.5X1"	789
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1.2GB MK538FB	12MS	3.5"	959
200MB IDE MK2224	17MS	2.5"	429
200MB SCSI MK2224	17MS	2.5"	489
340MB IDE MK2326		2.5"	599

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IDE			
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542MB 2205A	10MS	3.5"	759
976MB 2210A	10MS	3.5"	965
1GB 2112A	10MS	3.5"	965
1.6GB 2217A	10MS	3.5"	1395
SCSI-2			
560MB MC2105	10MS	3.5"	$ 759
584MB MC2205	10MS	3.5"	759
870MB MC1624 SCSI-2	14MS	HH	679
689MB MC2108 SCSI-2	10MS	3.5"	999
1.2GB MC2210 SCSI-2	10MS	3.5"	965
1.2GB MC2112 SCSI-2	10MS	3.5"	965
1.2GB MC1598 SCSI-2	15MS	FH	939
1.5GB MC1528 SCSI-2	14MS	FH	939
1.6GB MC1908 SCSI-2	10MS	FH	1649
1.75GB MC2217 SCSI-2	10MS	3.5"	1399
2.0GB MC1548 SCSI-2	14MS	FH	1349
2.1GB MC1926 SCSI-2	11MS	3.5"	1645
2.4GB MC1924 SCSI-2	11MS	FH	1849
3.6GB MC1936 SCSI-2	11MS	FH	2349

Seagate

CAPACITY M/N	SPEED	SIZE	PRICE
IDE			
42MB ST351A/X	19MS	3.5X1"	$ 125
80MB ST3096A	18MS	3.5X1"	167
107MB ST3120	15MS	3.5X1"	180
130MB ST3144A	15MS	3.5X1"	159
85MB ST9100A	16MS	2.5"	249
215MB ST3243A	16MS	3.5"	195
128MB ST9144A	16MS	2.5"	299
245MB ST3283A	12MS	3.5X1"	CALL
260MB ST3290A	16MS	3.5X1"	245
340MB ST3390A	12MS	3.5"	325
209MB ST9235A	16MS	2.5"	399
452MB ST3550A	12MS	3.5X1"	465
540MB ST3600A	11MS	3.5X1"	685
540MB ST3655A	12MS	3.5"	819
SCSI			
240MB ST3283N	12MS	3.5X1"	CALL!
457MB ST3550N SCSI-2	12MS	3.5X1"	549
525MB ST3600N SCSI-2	11MS	3.5X1"	669
343MB ST3390N SCSI-2	12MS	3.5X1"	385
1420MB ST41650N	15MS	3.5X1"	1159
1350MB ST41600N	12MS	FH	1539
1.2GB ST11200N SCSI-2	10MS	3.5"	929
1.2GB ST41200N	14MS	FH	995
1.6GB ELITE-I	11MS	FH	1699
1.6GB ST41651	15MS	FH	1279
2.1GB ST42100N SCSI-2	14MS	FH	1429
2.1GB ST42400 SCSI-2	11MS	FH	1769
3.55GB ST43400N SCSI-2	10MS	FH	2279
2.4GB ELITE-II	11MS	FH	1899
1.7GB BARRACUDA-I ST11950N SCSI-2 3.5"			1799
2.1GB BARRACUDA-II ST12550N SCSI-2 3.5"			2299
2.2GB ST12400N SCSI-2	12MS	3.5"	1999

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FACTORY NEW – 2 YEAR WARRANTY

CAPACITY M/N	SPEED	SIZE	PRICE
IDE			
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250MB WD2250	14MS	3.5X1"	229
340MB WD2340	12MS	3.5X1"	295
420MB AC2420	13MS	3.5X1"	429

CONNER

FACTORY NEW – 1 YEAR WARRANTY

CAPACITY M/N	SPEED	SIZE	PRICE
IDE			
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120MB CP30104H	19MS	3.5X1"	159
170MB CP30174E	17MS	3.5X1"	175
212MB CP30204	12MS	3.5X1"	299
250MB CP30254H	14MS	3.5"	219
340MB CP30344	14MS	3.5X1"	299
540MB CP30544	10MS	3.5X1"	595
SCSI			
85MB CP30080E	17MS	3.5X1"	171
170MB CP30170E	17MS	3.5X1"	204
120MB N/A	17MS	3.5X1"	199
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1.3GB CP31370 SCSI-2	10MS	3.5"	1015

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1.0GB C97558	13MS	FH	1395
1.6GB C3009	11.5MS	FH	1995
2.0GB C3010	11.5MS	FH	2295
2.1GB C2490	8.9MS	3.5"	2245

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2.0GB 5200S	12.6MS	FH	1695
3.5GB 5350S	11.5MS	FH	2995

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250MB 3125	15MS	3.5X1"	235

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256K X 1-100NS	CALL!
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256 X 1-80NS	CALL!
256K X 1-70NS	CALL!
256K X 1-60 NS	CALL!
256K X 4-100NS	CALL!
256K X 4-80NS	CALL!
256K X 4-70NS	CALL!
256K X 4-60NS	CALL!
64K X 4-120NS	CALL!
64K X 4-100NS	CALL!
64K X 4-80NS	CALL!
64K X 1-150NS	CALL!
64K X 1-120NS	CALL!
64K X 1-100NS	CALL!

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64 X 4-25	8.00
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32 X 8-20	8.00
64 X 4-20	10.00
16 X 4-20	5.50
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80386 DX/33	80
AMD DZ40	80
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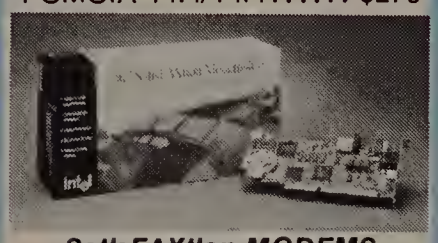

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Bravo 486	4Meg	500987-002		199.00
	8Meg Kit	500987-003		398.00
	16Meg	500987-004		658.00
Premium 386/25, 16 SX	1Meg	50071B-001		59.00
Premium 386/33	1Meg	50071B-002		59.00
Premium II	1Meg	500780-003	WPB	59.00
386SX20, 486-25, 25E, 33	4Meg	500780-004	WPB	199.00
Premium Tower, 386/33TE, 486/25TE, 486/33TE	8Meg	500780-001	WPB	398.00
Cupid Memory Board	0-32Meg	500B1B-001		169.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	195.00
Z386SX	2Meg	Z-605-1 modules	119.00

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IBM PART NO.	WORKS WITH MDDEL NO.	PRICE
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30F5360 (2Meg)	30-286, 25-286, 50 MTHR BD.	124.00
6450375 (1Meg)	80-041	79.00
6450379 (2Meg)	80-111, 311-121, 321, 081, 161	89.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	189.00
6450604 (2Meg)	70-061, E81, 121, 50Z, 55SX, 65SX, P-70, 55LS, 85LS, X-Station 120 & 130, 35SX, 35LS, 40SX	89.00
6450608 (2Meg)	70-A21, A-61, 8-21, B-61, 35SX, 35LS, 40SX, Val Pt, 325T	90.00
78X8955 (128K)	25	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	199.00
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1057035 (512K)	P/51-286	49.00
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92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	209.00
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6450128 (4Meg)	57SX, 90, 95, P-75, 57SLC, 56, 565LC, P/S1, 3865X, Mod-2123, 2133, 2155, Val Pt 77, 486CS2, 486SX, SVR85 Value Point 77 486DX2, 486SX, SVR 85	209.00
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6450130 (8Meg)	56, 57, 57SX, 90, 95, P-75, 575LC Value Point 77 486DX2, 486SX, SVR 85	439.00
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07G1415 (4Meg)	Thinkpad 750, 750c	239.00
07G1416 (8Meg)	Thinkpad 750, 750c	449.00
66G0094 (16Meg)	Thinkpad 750, 750c	1029.00
07G1420 (4Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	249.00
07G1421 (8Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	449.00
60G0378 (8Meg)	Thinkpad 350, 350c	285.00
60G0379 (16Meg)	Thinkpad 350, 350c	769.00
92F8804 (2Meg)	N45SL	119.00

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DeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
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	4Meg Module	112534-001	219.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	329.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	229.00
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Dki 400	–	–	–	95	–	–	–	–	–	–	–
Dki 400 E	–	–	135	189	–	–	–	–	–	–	–
Dki 830, 840	–	–	–	109	–	–	–	–	–	–	–
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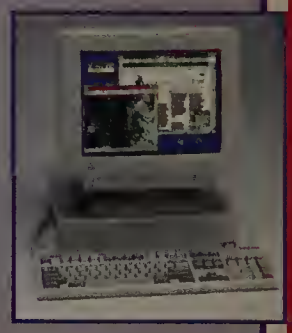

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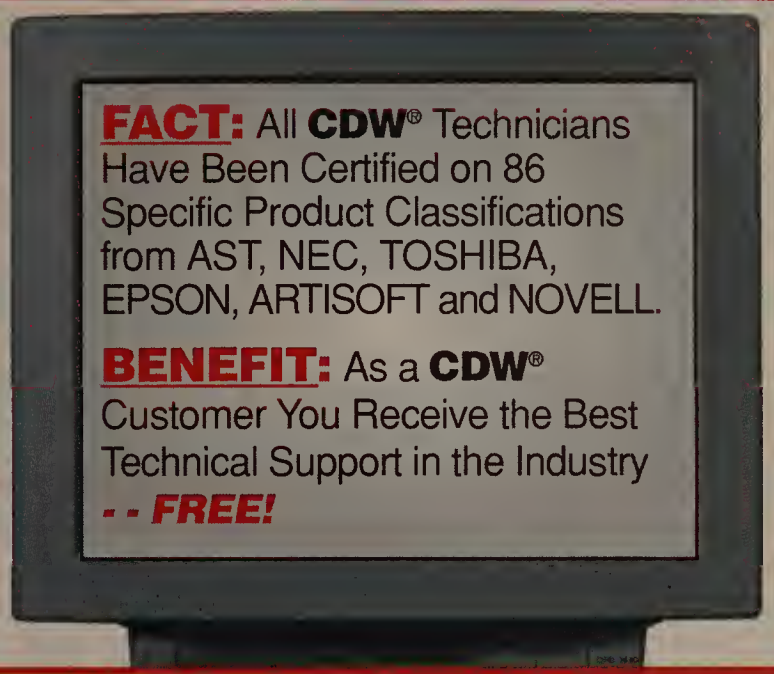

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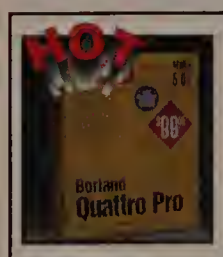

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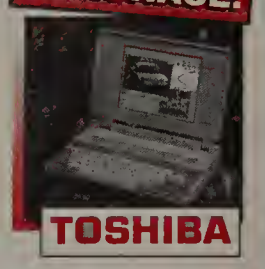

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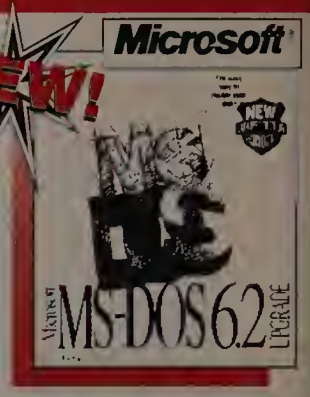

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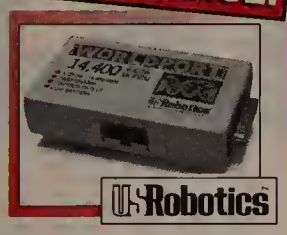

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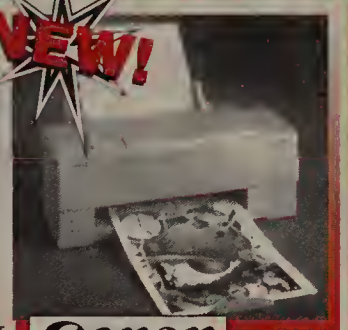

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956 Draw/paint software
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958 Printers
959 Multimedia products
960 Utilities
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Pummeling Moles, Learning to Play Poker, and Desktop Pinball

Grit your teeth, take aim, and bash those devilish rodents! Slam the enormous hammer down as you prowl the mole-infested landscape. Watch in wonder as your mild-mannered mouse is transformed into a blunt object.

I can remember my first Whac-A-Mole game as if it were yesterday: a county fair, a grid with little holes through which mechanical moles popped up for me to crush with my gigantic mallet. There was something perfect, even dreamlike, about the mindless, bloodthirsty state I fell into trying to guess from which hole the next mole would emerge...so I could smash it, and the next, ceaselessly, mole after mole after mole. Zen and the art of mole-bashing? Testosterone overload?

SWFTE's Windows-based PC version of Whac-A-Mole is almost as silly (and damn near as habit-forming) as the real thing. Five animated moles pop from their holes, taunting you, daring you to bop them with the huge hammer you control with your mouse. First on mean city streets, then in a disco, then on the moon, and finally in the darkest jungle, these pests leave you no choice but to destroy them.

You'll need fast reflexes: A score of 90 percent is required to get from one level to the next, and each time you jump a level the dratted moles get faster and meaner. The game totals your score after every round and displays piles of dead moles to rouse you to ever-higher frenzies.

If someone (like your supervisor) asks what you're doing, tell her that this is a terrific way to make sure your mouse is working perfectly. It is, too!

You'll Never Learn Cheaper

Still in search of the ultimate PC poker game, we turn this month to Amarillo Slim Dealer's Choice. In many ways, this is the best poker simulation I've seen yet. Fast, flexible, and with a good "teaching" option, its only serious deficit is the lack of amusing poker chat.

The game, which includes no fewer than 28 poker variations, is almost infinitely customizable. You can set every house rule from maximum bet to raise limit. You can pick your opponents from 15 players who range from casual to dangerous. You can turn summary advice on and off; full advice is available at a mouse click. There's even voice simulation—but unless you have a sound board, it sounds like a frog is trapped inside your unit.

Since the game doesn't bother with fancy animation (cards don't float across the table; they simply appear), the play moves quickly. But without the traditional snappy repartee, this poker game just doesn't feel like the real thing. Still, between the fine tutorial function and complete on-screen explanations of rules and game variations, this is a fine way to improve your game.

Killer Rabbits

The catacombs beneath the town of Morbidity are not recommended for casual tourists. Huge bugs and slimy zombies jump out of nowhere to attack you, and short-tempered skeletons with nasty swords may be close behind. There are even killer rabbits! Nonetheless, for armchair adventurers with a secret desire to play Rambo, Froggman's The Curse of the Catacombs is a great way to relax. The game's amazing $14.95 price tag is relaxing in itself.

The Curse of the Catacombs is billed as a "3-D virtual reality" adventure, which is a wild overstatement. As far as I can tell, all this means is that you view the catacombs through the eyes of the main character: You see a wall. You press the arrow key, and the screen swings around so you see a passageway. Big deal. Apparently, Froggman's PR department decided that any excuse to print the fashionable "VR" phrase on the box would be acceptable.

Whac-A-Mole gives you the tools to strike a blow against the rodent hordes. And those damn moles get in everywhere, even to this fancy disco party.

This aside, the game really is fun. The catacombs are lined with tapestries, many of which conceal secret alcoves full of useful treasure and weaponry. You can blast your way into the hidden rooms with one of several magical weapons. Movement, via cursor keys, mouse, or joystick, is fast and intuitive, and there are 16 levels to explore. There's even a Hints and Solutions section with maps to the Garden of Forgotten Souls and the Lair of the Succubus. Just watch out for those killer rabbits.

Real Bells, Real Whistles

Windows' graphics and multimedia capabilities rarely get as tough a workout as in Take-A-Break Pinball, an

By Michael Goodwin

IN THE CURSE OF THE CATACOMBS, you will need to blast your way through the catacombs to find out what sort of evil or hidden treasure lies waiting to be discovered behind that tapestry.

impressive simulation of the classic arcade machines. This package includes eight pinball games, and while none of them is the classic Fireball 500, the sizzling sound and split-second bouncing bumper-ball action will give even pinball wizards a serious run for their money.

Take-A-Break Pinball's designers built in several unique features that the real-life machines could never offer. For instance, in Planet Pinball, if you flip your ball into the Buttes of Estros Trap Hole, an animated pterodactyl steals the ball and stashes it in her nest. You'll also enjoy animated backglasses, time warps, and the most amazing multiball play mode I've seen. Awesome!

Dynamix has done an amazing job of capturing the pinball experience: it has flippers, roll-over buttons, trap holes, targets, kickers, the inimitable backglass art. You can even use your keyboard controls to "shove the machine" in order to goose the ball away from a hazard, or onto a high-scoring roll-over (the experts call this "grunching")—but a delicate touch is needed to keep from setting off the tilt penalty.

I do have two complaints about Take-A-Break Pinball. The flippers are a little sticky, and you must have a sound board in order to hear the bells and whistles. Not a peep, pop, siren, or clang emerges from your PC's built-in speaker. These problems aside, I am totally impressed.

- **Whac-A-Mole** $39.95; SWFTE Int'l; 800/237-9383
  Reader service no. 638
- **Amarillo Slim Dealer's Choice** $29.95; Villa Crespo; 708/433-0500
  Reader service no. 639
- **The Curse of the Catacombs** $14.95; Froggman; 800/876-3764
  Reader service no. 640
- **Take-A-Break Pinball** $49.95; Dynamix; 800/326-6654
  Reader service no. 641

Michael Goodwin is a contributing editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).* ■

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Diagnosis for the Rest of Us

Take this word test: If I say "dog," you say "cat." If I say "RAM," you say "not enough." Okay, one more. If I say "deadline," you say "The computer's down." I thought so.

The more complicated my computer becomes, the more I tinker with it, and—no surprise—the more often it's down. And I don't mean just depressed, either. So to minimize computer downtime, I've armed myself with a battalion of diagnostic software, some of it even free, to gain insight into my computer. And to keep myself out of trouble, I've devised a few upgrading and installation rules.

An important first step—and something most of us don't bother with until it's too late—is to inventory everything in your system. That way, if your memory manager or some other variant goes kaflooey (no, you won't find that word in the index), you've got an answer when tech support asks about the chip on your video board. Or when your newly installed sound card won't work, you can check your list of assigned interrupts and determine the conflict.

Profiles in ASCII

Getting a profile of your computer is easy. If you have DOS 6.*x* or Windows 3.1, a no-frills diagnostic program is probably on your PC already. Microsoft Diagnostics, known as MSD.EXE, does an exemplary job of reporting details—in my case, *45 pages* of details. To get a full report on your system, simply enter **MSD /P MSD.RPT** at the DOS prompt. To print a report (a good thing to have in case your system is so messed up you can't get to the hard disk), follow that command with **TYPE MSD.RPT > PRN**. Whenever you add a new board, have MSD print a new report for you. A word of caution: Always run MSD from DOS; if you do it from inside Windows—even from a DOS box within Windows—you'll wind up with inaccurate results.

For about $100, though, you can get a great diagnostic program that runs under Windows. Dariana's WinSleuth Gold Plus not only knows a few tricks that MSD never heard of, it's prettier to look at, too. WinSleuth pokes into every nook and cranny of your system, examining the components you'd expect, such as drives, video, and memory. It then goes a step further by supplying specifications (and tech support phone numbers) for over 40 popular devices, so you can check your system for the availability of their specific DMA channels and interrupts. That means you can discover whether the CD ROM drive or sound card you've been wanting is compatible *before* you buy it. • *WinSleuth Gold Plus $99.95 through March, $189 thereafter; Dariana Software; 800/892-9950, 714/236-1380, 714/236-1390 (fax). Reader service no. 633*

Getting a handle on your computer is one thing; preventing problems is another. Here are a few tricks—all learned the hard way—for averting disaster before it strikes.

A little regular maintenance can save you a lot of grief. Not long ago, a blue haze started overshadowing everything on my monitor. I thought the worst: The monitor's shot, the video board's bad, or maybe my mind's going. Turned out to be a loose video cable. So now I check and tighten every cable on my system—including power cords—twice a year. And when I crack the case, I examine the add-in boards and internal cables to make sure everything is properly connected.

If you upgrade your system—say, install a sound card or a new caching controller—don't add anything else for at least a week. Similarly, don't add two items—whether hardware or software—at the same time. I've made that mistake a number of times (hey, looking at new stuff is a part of my job), and I've always regretted it. It's a lot like trying to house-train a whole litter of puppies—when things don't go as planned, you never know who's to blame. Best to make sure one new addition is well behaved before you try another.

Finally, I keep two emergency floppies. I let Norton Utilities' Rescue Disk create the first. It makes a bootable floppy that holds a copy of my system setup information, boot record, and File Allocation Table, along with a way to retrieve them. It also contains critical drivers and a bunch of Norton and DOS utility programs, each essential for recovering from a disaster. The second rescue disk has a copy of my tape backup program. That's because the last time my hard disk crashed I had a full backup, but the program I needed to restore it was—you guessed it—on the hard disk. • *Norton Utilities $179; Symantec Corp.; 800/441-7234, 408/252-3570. Reader service no. 634*

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 12 for contact information).

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By Steve Bass

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"I'd rather stick needles in my eyes than talk to one of those techno-wannabees who thinks a bus is some form of public transportation."

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